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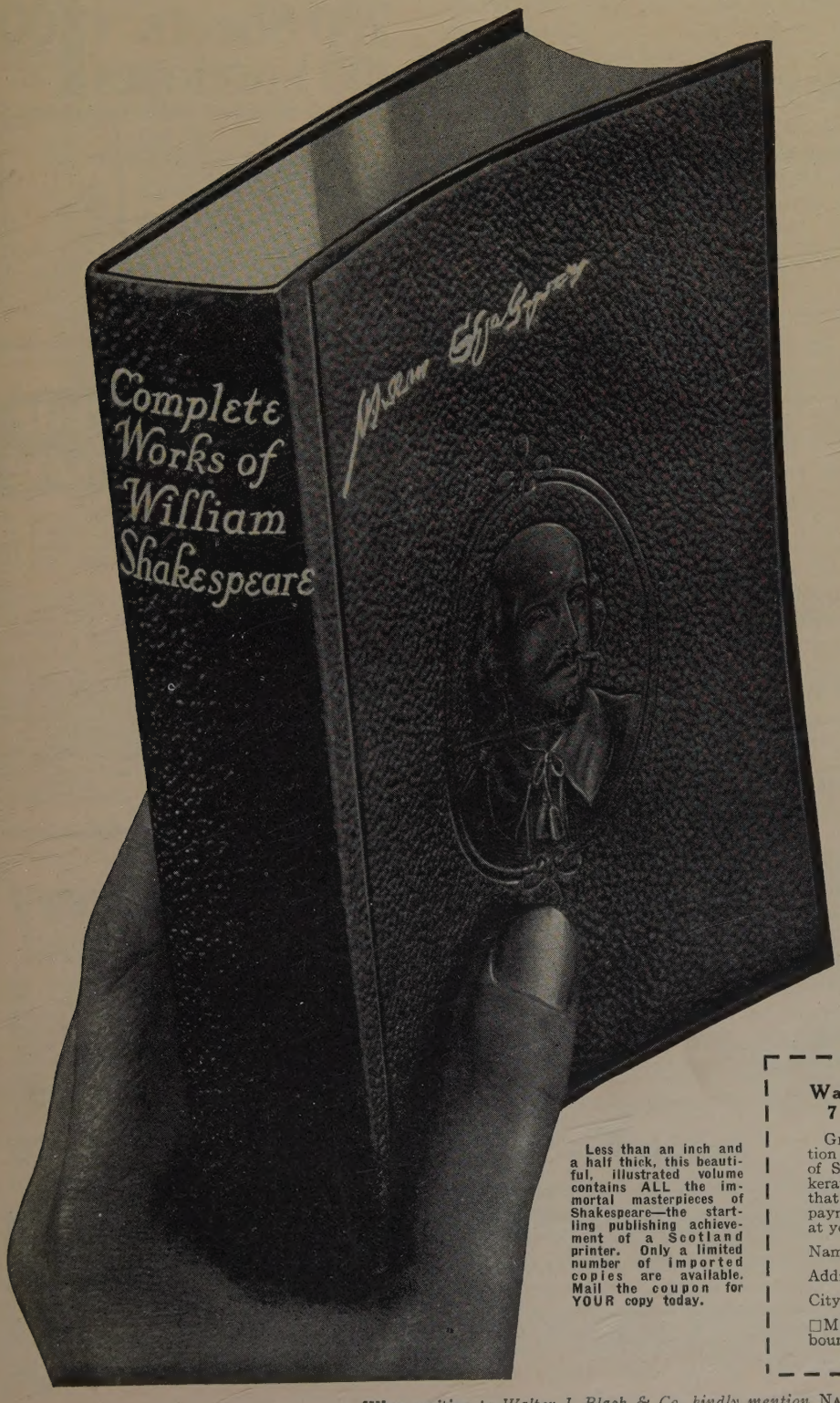

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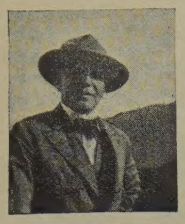

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"The Logger"

This is the title given by Salone Ellis to her story of life in the big timber published by Small, Maynard and Company of Boston. It is the story of lumbering in the great virgin stands of Douglas fir, spruce, pine and cedar of Washington. So far as the story concerns logging it is fair; so far as it concerns life in the logging camps it is good. As fiction it is interesting, with some well-drawn characters. Criticism may be levelled at this volume on one ground, however,—that it fails to strike a blow for the rehabilitation of the acres logged off. To us the hero, with his ideals of what an employer should be, would have been stronger had he been endowed with a vision to see that he was reaping but not sowing; that he was leaving behind him a trail of denuded acres and taking no pains to restock them. In only one paragraph in the entire book does the author hint at this view, when Mother McKnight, good angel of the loggers, says, "Hearing that peculiar groan of the tree when it was falling kinda made me feel like it was trying to tell man that he was really destroying his own beautiful kingdom. . . . Trees seem to belong to and be a part of the divine plan, like the sky and mountains and the birds and the flowers."

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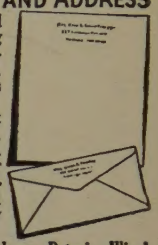

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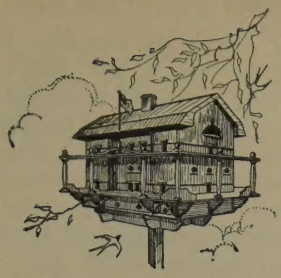

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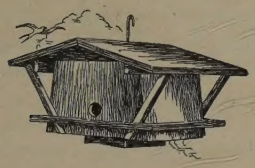

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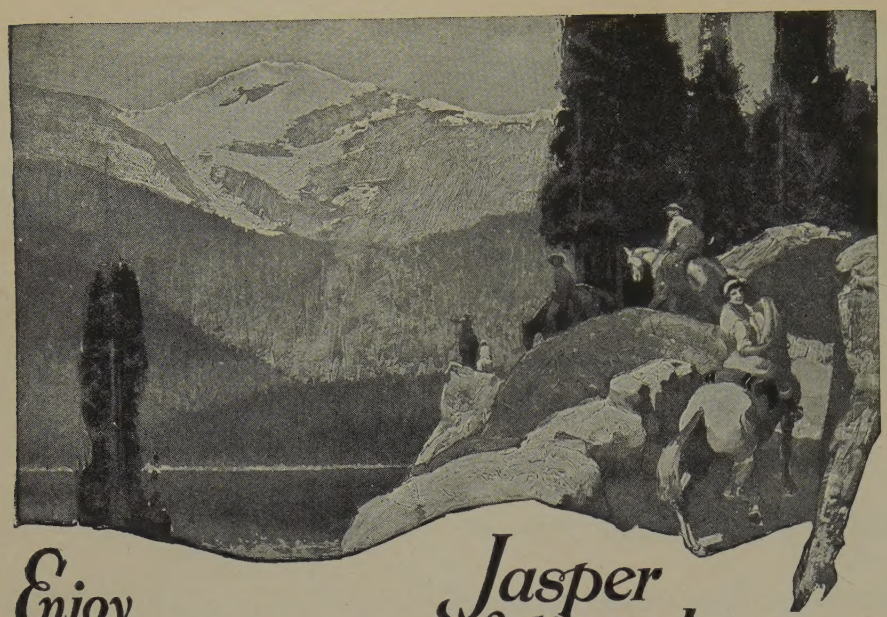

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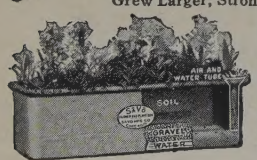

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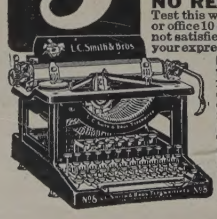

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The Smallest Willows

"On the cloud-mantled summit of Electric Peak, a thousand feet above the last dwarf pine, are forests of willows so small that several hundred may be held in the palm of the hand," says P. H. Hawkins in his book, "Trees and Shrubs of Yellowstone National Park," published by The Collegiate Press. "These compact, pygmy forests might easily be mistaken for moss. They grow on moist soil or bare rocks below dripping snowbacks, for even here the willow must be close to water. Its scientific name, 'Salix,' comes from two Celtic words, 'sa' meaning near and 'lis' meaning water. On Electric Peak this venturesome tree is composed of one slender twig, one-half the length and diameter of a match, and a single leaf and 'pussy.' The nectar-loving insects swarm about it as they do about its larger relatives. A heavy bee brings down the whole tree while he sips the nectar with his back on the ground. Sixty sunny, frosty mornings with as many windy afternoons and nights, interspersed with daily snowstorms, form its entire growing season. It trails along the ground like a vine, taking root at every bud. The twigs are yellowish, the leaves oblong or oval. It was named after William E. Dodge, of New York City, who was for many years a liberal patron of botanical research. Thus far it has been found only on Electric Peak, Sheep Mountain, and on the Tetons."

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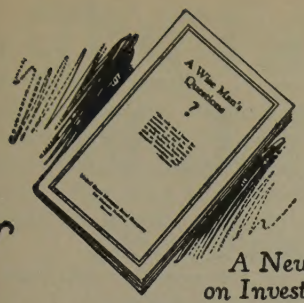

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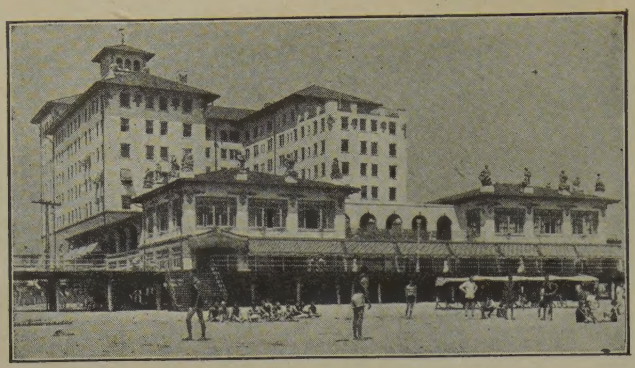

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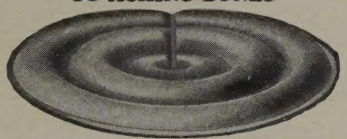

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California Flowers

Frequently over a space of years a technical volume not in the textbook class reaches the proportion of a "best seller" in the number of copies sold. One of these is "The Wild Flowers of California," written by Mary Elizabeth Parsons and published by H. S. Crocker Company, San Francisco. It is a valuable reference volume on the flowers of that state and has stood the test of time long enough to be classed in the authority group.

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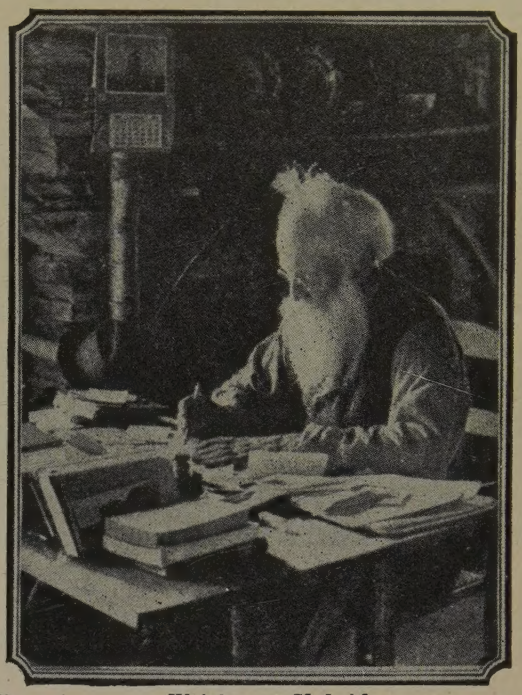

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Nature Calendar

MAY

> "May is building her house of petal and blade;
> Of the roots of the oak is the flooring made,
> With a carpet of mosses and lichen and clover,
> Each small miracle over and over,
> And tender, travelling green things strayed."
>
> —*Richard Le Gallienne.*

This is apple blossom time when orchards are filled with fragrance and beauty.

The pitcher plant is an ogre of the swamps and peat-bogs. The reddish-purple flower lures insects to the plant. Within the hollow of the pitcher-shaped leaves you may see many little creatures that have succumbed to this carnivore.

Dutchman's breeches, trilliums, and adder's tongues grow in thick patches over rich wooded hillsides.

The lacy white flowers on the spikes of the mitrewort look like beautiful snow crystals.

Patches of bluets are growing by the wayside.

Gardens are bright with flower beds of gayly colored tulips and white and purple irises.

By the number three is the trillium governed; three petals, three sepals, twice three stamens, three styles, and three leaves.

Wild geraniums are attracting hosts of bees and insects.

Blue cohosh and twinleaf, members of the barberry family, are blooming in rich woodlands.

May is "home month" for most of the wild folk.

The warbler migration is a distinctive feature of the bird-life in May. We enjoy the visit of these sweet-voiced songsters.

The ovenbird's vibrating song of "teacher, teacher, teacher," penetrates the dense woods.

The young of the great horned owl are learning to hunt rabbits, rats and mice.

House wrens usually court during the month of apple blossoms. It is not until the middle of May that they begin nest-building.

Squirrels are now occupied with parental cares. There usually are from four to six little ones to feed.

During the winter the tufted titmouse who came to bird lunch counters for food, seemed friendly and companionable. Now when you meet him in the woods he appears quite unapproachable; but sit quietly for a few moments and you will find yourself thoroughly inspected by this bird of insatiable curiosity.

So deeply interested does the male mockingbird become in the exercise of his beautiful and versatile voice that to the female is often left the responsibility of nest-building and home cares.

Now the chorus of the spring peepers is drawing to a close while that of the common tree frog is just beginning. For several weeks you may hear them both singing in the swamps.

"A May bear is always a lean bear."

Muskrats are busy raising their large families.

New accommodations are being added to the stucco dwelling of the mud daubers.

The blue flag is robbed of its nectar by the small yellow butterfly (Colias philodice) which is able to go to the base of the flower between the divisions and reach the nectar with its long tongue.

Golden ragworts and painted-cups lend brightness and color to the marshes where they grow.

Salamanders once more abound under rocks and old logs in the woodlands.

By the first of May the tadpoles of the common leopard frog have grown an inch or more in length.

Prepared for NATURE MAGAZINE by the Cleveland Museum of Natural History

SEA-PINKS—ANIMALS, NOT FLOWERS

(Metridium dianthus)

These "seaflowers" are voracious feeders, catching with quickness and ease the hapless creatures which come within reach of their tentacles. They are also good to eat, and smell not unlike a warm crab or lobster, when prepared for the table.

NATURE MAGAZINE

Vol. V MAY, 1925 No. 5

"Only as far as the masters of the world have called in Nature to their aid, can they reach the height of magnificence."
—EMERSON.

Some Flower-like Animals of the Sea

By WALDO L. SCHMITT

(ILLUSTRATIONS CONTRIBUTED BY YVONNE LOSH, NEW YORK CITY, BY PERMISSION OF F. SCHENSKY, HELGOLAND)

THESE "flowers" of the sea (sea-anemones) have excited the wonder and admiration of mankind throughout the ages, and have even furnished poetic inspiration. Their beauty of form and color can scarcely be matched elsewhere in the animal kingdom, for after all they are animals. So zoologists have gone to the flowers for their comparisons and descriptive names. Hence we have the sea-anemone, the sea-rose, the sea-pink, the dahlia wartlet, the daisy anemone and even a widowed anemone, one with long and drooping tentacles which especially when at rest resemble the pendant branches of the weeping willow tree. Even the larger groups in which these organisms are classified are called Zoophytes, Anthozoa, or Zoantharia, all meaning animal plants or flowers.

A mere description of the varied and marvelous display of color that greets the eye of those who have had the exquisite pleasure of observing these animals in their native haunts reads like gross exaggeration. Words fail him who would tell of the wonders he has seen. Instinctively one likens their profusion of color to the colors of the rainbow. Miss Losh, who contributes the accompanying illustrations, and has seen these very compositions in life, exclaims: " 'What beautiful flowers' you would say if you could see these marvelous creations in shades of rose, orange, white and brown, looking like huge carnations with thick stems. There are others, too, whose petals seem to have unfolded, making them look more brilliant and transparent. See, they tremble slightly, they stretch and search about as though they wanted to take hold of something."

"What marvelous colors they have. It seems as if they had been stolen from the rainbow. No florist could grow flowers with more perfect shadings and markings than these creatures of the sea, in their many shades of red, violet, brown, yellow and green."

Sea-anemones belong to one of the twelve major divisions of the animal kingdom, the Coelenterates, literally "stomach animals." They are scarcely more than that. Their body-wall surrounds a single sac-like body and digestive cavity combined. The mouth opening is situated at the center of the disc, carrying around it the tentacles. It is connected with the stomach cavity by a short gullet. In most anemones the tentacles have a little perforation at the tip, as can be readily observed in the illustrations. Through these pores slender streams of water may be ejected with considerable force when the animal is disturbed.

These "seaflowers" are voracious feeders, catching with great celerity and ease the hapless creatures which come within reach of their tentacles. The tentacles are not only sticky with a secreted mucus, but also richly ciliated, being furnished with tiny, mobile hairs, or lashes, always beating toward the tentacle tips, so that when food is not being taken, all foreign substances or particles are wafted away from the body. But when stimulated by the diffusion of the juices of food, or the contact of food material or prey itself, the tentacles turn inward, and point toward the mouth opening.

The matter of securing food is hardly so passive an act as would appear. As is characteristic of "stomach animals," the tentacles are richly provided with nettle-cells, little trigger-actuated mechanisms, as it were, consisting of a tiny sac filled with an

irritating fluid, that has the power of benumbing the animals that constitute the prey of the anemone, and severely stinging larger ones. Within the sac is coiled a slender, hollow thread often barbed. Projecting from the outer surface of the nettle-cell is a tiny hair-like process or trigger, which when touched discharges the coiled thread, which has considerable penetrating power, and voiding through it the fluid contents of the sac. The sting or burn of this poison charge is familiar to most of us who have bathed in waters infested with sea-nettles.

THICK-HORNED SEA-ANEMONE
(Urticina cranicornis)
The superficial resemblance of this creature to a cactus dahlia will be apparent. It is also known as the Dahlia Wartlet.

Thomas Jones in his *Aquarium Naturalist* tells of a more decisive proof of the potency of these nettle-cells, than that of placing the tentacles in contact with the skin for a few seconds. He suggests biting one of the tentacles of an anemone between the foreteeth, applying at the same time the tip of the tongue to the part bitten. The taste is described as something between that of a capsicum, or red pepper, and a red-hot poker.

A further means of defense and offense is at hand in most anemones in the shape of long gelatinous coated threads called acontia projected at times with great rapidity through imperceptible openings in the body-wall. These threads are even more plentifully supplied with nettle-cells than the tentacles, and enable the anemones to overcome fish and crabs often of relatively large size.

We usually consider these animals as more or less sedentary organisms, but many of them are not quite so immobile as we are prone to think. Dr. McClendon, while studying some animals in marine aquaria, noticed that some specimens of *Metridium*, after being placed on the bottom of an aquarium, would creep up the side of the glass to a more favorable position. He likened their method of progression to the ordinary creeping of a snail, consisting of a succession of waves traveling across the pedal or basal surface from behind forward. In the anemone these waves are larger and not so rapid or regular as in a snail. A wave required about a minute to traverse the foot of the anemone observed, and before it disappeared another had commenced. He "threw a number of anemones into an aquarium to observe their actions. They threw out acontia which caught hold of any solid object near them and contracted until some portion of the foot touched the object and caught hold. One anemone sinking to the bottom and resting on its tentacles contrived to right itself by suddenly contracting and expelling water from its mouth. I observed this once or twice subsequently, but rather think it a coincidence, rather than a common reflex."

There are, however, some really sedentary forms like *Cerianthus*, which burrow in the sand and mud. There they live within tubes of their own construction, and for this reason they are exceedingly hard to secure, as usually but little more than the expanded "flower" extends above the surface of the bottom, and this upon approach is instantly withdrawn into the buried tube. These Prof. Kingsley remarks are "thick felt-like tubes of mud and sand agglutinated by mucus secreted by the nu-

merous glands in the body-wall and by entangled nematocysts" (nettle-cells).

Our American *Cerianthus* grows to a considerable size, specimens in excess of eight inches in length being recorded. The body is a dark chestnut brown, pale bluish just beneath the tentacles; the oral disc pale yellowish brown, as are the marginal tentacles, the longer of which are barred transversely with six or eight dark-reddish brown spots.

Metridium dianthus (Ellis) the "sea-pink" is possibly our most beautiful anemone. It certainly is our most showy one when fully expanded. Certain parts of the ocean bed, of course near shore, are simply covered with them, and in regions where it is abundant it is very common on piles. The species is rather widely distributed, occurring on the coasts of Europe, and North America on our East coast from the Arctic to Cape Hatteras, and on the West coast from Alaska to San Francisco. It may attain a height of six inches and a diameter of three. In color *Metridium dianthus* ranges from the pure translucent white "as if arranged in the finest Coan vestments," through cream, flesh, salmon-red, pale orange, various tints of red to a full minium-scarlet, and shades of brown from warm umber, or fawn-color, to dingy blackish olive. The tentacles generally are of the same color as the column, except in the olive and brown varieties, where they are sometimes almost wholly "pellucid white."

The dahlia wartlet, *Urticina crassicornis,* or the thick-horned Sea Anemone, as it is sometimes called, though usually not as tall or high, has a greater expanse of "flower," often of five inches, or more, in the larger deep-water specimens. The surface of the body is covered with more or less irregularly scattered adhesive warts, hence the name wartlet, to which, under natural conditions, all manner of small stones, sand and shell fragments adhere, rendering the animal most inconspicuous when contracted. Sea-anemones are not always the beautiful showy things we see pictured here. When disturbed by the recession of the tide in the case of forms attached, or living above the low-tide mark, or by a jarring of the substratum to which they are attached, or by a sudden attack or rude touch, they contract to an amazingly small fleshy lump, most inconspicuous, and often disappearing completely from sight as in *Cerianthus,* and in the dahlia wartlet, and others when attached to rocks below the surface of the sandy or gravelly bottom. Such a contracted

CERIANTHUS AND DAHLIA WARTLETS

And also a contracted specimen on the rock above to the left and a resting widowed anemone in the right upper corner.

specimen of *Urticina* is attached to the rock above the expanded *Cerianthus*. Gosse calls the colors of the dahlia wartlet very sportive, saying that "scarcely two specimens can be found exactly alike. The body may be dull green, streaked and flaked with crimson with pale grey warts, and the disc or 'flower,' glaucous olive with conspicuous scarlet radial bands edged with white, proceeding from each outer tentacle in pairs, which curve around the foot of the tentacles of the higher rows, and are lost at various distances from the center; those pairs which enclose the inner tentacles extend farthest and are most conspicuous." These bands are highly characteristic of the species and can readily be seen in the head-on-view here given of it. The tentacles of this color phase are a "pellucid light brown, with a band of opaque white across the base, which frequently stretches a little way up each side; a broad band of crimson surrounds the middle, bounded below, and sometimes above, by a narrower band of subopaque white. All of these bands are undefined, and are often rendered subpellucid by distension." The mouth is generally tinged with crimson, with gullet and stomach light grey. Again the body and disc may be a dull crimson, with the radial bands and central region more brilliant than the rest, with either pellucid white tentacles having conspicuous bands of opaque white, or crimson tentacles, with purplish bands. Yellow, straw to apricot-colored specimens also occur, while the generally very large deep-water specimens usually seem to have lost all color, being a semi-pellucid dusky grey.

THESE FURNISH POETIC INSPIRATION

It is no wonder that these beautiful Sea-pinks have been pictured in everlasting poetry.

The widowed anemone *Sagartia viduata* called in England the "snake-locked" anemone, has a ground color of "light buff, sometimes merging into a warm fawn, or wood-brown, at others into a flesh-hue or even pale scarlet. This is marked with longitudinal bands of paler hue, sometimes almost white; the bands being equal to the interspaces. As these bands approach the base, they become more defined, and the contrast between the alternate dark and light hues is beautifully distinct, especially as they are separated by slender jagged lines of very dark brown. The whole upper parts are freckled with numerous brown dots. The disc is a dull whitish-grey covered with a regular speckled pattern of deep brown, or blackish, and lighter greyish brown." The tentacles are translucent grey, marked on each side with a line of dark brown running through the whole length. At times the tentacles assume a distinctly nodulous appearance, an evanescent condition that appears and disappears at irregular intervals. The name "snake-locked" refers to the very snaky appearance of the tentacles of the active anemone. In this species they are very numerous, upwards of two hundred in number. *Viduata* ("widowed") was the name first conferred on it by O. F. Müller, because of the white

MAN HAS ALWAYS ADMIRED THESE SEAFLOWERS

Partially expanded Sea-pinks having various color phases. Those in the foreground are Dahlia Wartlets.

and black lines, which seems to have been remarkably contrasted in his original specimen. When at rest, after a satisfying meal, the tentacles droop like the branches of a weeping willow tree. Such a resting specimen appears in the upper right-hand corner of the picture of *Cerianthus*.

Anemones, because of their more or less sedentary habits, can endure long periods of fasting, and withal are very long lived. It is said that Sir J. Dalyell kept one alive for over twenty years, and that he had another, apparently of equal age with the former when taken, that lived for thirteen or fourteen years in his possession.

From Faber's Fisheries of the Adriatic we learn that "all sea anemones are edible, and are to be met with in large quantities in most fish markets, such as Marseilles, Cette, Bordeaux, Bayonne, etc.," and that the "green" anemone "occasionally appears in the markets of Trieste and on the Coast of Istria where it is caught near the shore on stony and sandy beds; it is sprinkled with flour and fried in oil."

In speaking of the *Urticina crassicornis,* Dicquemare says, "Of all the kinds of sea anemones, I would prefer this for the table; being boiled sometime in sea-water, they acquire a firm and palatable consistence, and may be eaten with any kind of sauce. They are of an inviting appearance, of a light shivering texture, and of a soft white or reddish hue. Their smell is not unlike that of a warm crab or lobster." *Metridium dianthus* also "is good to eat," according to the same authority.

In the back of the magazine members will find a nomination blank for their convenience in calling to the attention of their friends the privileges of the American Nature Association and enjoyment of NATURE MAGAZINE. Extra copies of this form will be sent on request. Will each member kindly nominate one or more friends?

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Bloodroot

By ALBERT A. HANSEN

FEW OF our native wild plants are as well named as bloodroot. The slightest bruising of the fleshy root is closely followed by a liberal exudation of a bright-red, blood-like juice that stains the hands or any other object it may touch. On account of the lasting stain produced, the juice formerly found use as a dye and was utilized by the American Indians as a war paint.

The bloody juice also possesses medicinal properties when taken in small doses. It is said to aid digestion by promoting the secretion of the digestive juices, and a lump of sugar stained with the red fluid is an old-fashioned home treatment for stubborn colds. But woe betide the foolish one who ventures an overdose! Not only is the flaming juice exceedingly acrid, causing severe burning and irritation of mucous membrane, but it contains an alkaloid known as sanguinarin that may cause severe internal poisoning. So powerful is this poison that fatal results from overdoses taken medicinally have been recorded. Fortunately, there is little danger of poisoning from eating the fleshy root on account of the burning, stinging taste and the repugnant juice that serves as a red signal of danger. The generic part of the scientific name, *Sanguinaria canadensis,* is descriptive of the vivid red juice, which is also found in the stem and leaves.

EPHEMERAL BLOSSOMS OF BLOODROOT

Note how the rolled leaf in the foreground protects the flower and bud.

Although possessed of both poisonous and medicinal properties, bloodroot is nevertheless a charming and attractive plant. During early April days one may frequently discover bloodroot buds burrowing their way through fallen oak leaves in rich northern woods, in Kipling's words:

> "Green among the draggled drift,
> Frail and faint and first."

The pair of green sepals in which the flower bud is enveloped fall as soon as the petals unfold in the bright light of the leafless forest. The flowers are almost perfect in their beauty, each possessing from eight to twelve graceful, lance-shaped petals that may be pure white or faintly tinged with rose.

Their beauty, however, is short lived. The shy petals are exceedingly fragile, and it seems that the slightest wind causes them to fall. But even a fleeting acquaintance with the ephemeral beauty of this delicate flower is a rich reward for exploring the early-spring woods in search of newly awakened plant life.

Unlike many of our handsome and attractive wildflowers, bloodroot is in little danger from vandalistic, promiscuous flower gatherers. The species is well protected by the fleshy root, bloody juice and evanescent flowers. The petals rarely remain after the blossoms have been picked. Furthermore, the heavy tuberous root can be readily transplanted into a shady nook in the wildflower garden where the lovely blossoms will act as yearly reminders of the return of spring. After the petals fall the large characteristically lobed leaves develop quite rapidly.

Bloodroot is a member of the poppy family, a group of plants many of which possess highly colored juices containing poisonous narcotics. In this family is found the opium poppy with milky juice, celandine and Mexican poppy with bright yellow juice, and the garden bocconia with reddish juice. Among bloodroot's handsome relatives may be mentioned the common and attractive California poppy or *Eschscholtzia,* the strikingly beautiful oriental poppy, and the Flanders poppy with its dark-eyed scarlet blossoms that bring memories of the carnage of war.

In the far north is found the Arctic poppy, a beautiful yellow-flowered species which seems strangely out of place in its chosen surroundings. Rearing its delicate bloom amid the snows of departing summer, it seems to be the bravest of all that hardy company.

The Value of Nature Study in Camps

By EDITH POLLITT HOLT
Camp Director

IS IT possible that any one of us has forgotten our very first night in the woods—the awful stretching stillness, broken perhaps by the dismal wailing call of the loon, the weird lament of the screech owl, the guttural utterance of the bullfrog, or the insistent fear-inspiring song of the whip-poor-will?

To most of us who are city bred this first night is stamped upon our memory so indelibly that we will never forget how we lay on our cots, trembling and praying for morning to come. For we were not brought up—the majority of us—with the idea of the beauty and love of every one of Nature's creatures, every animal, tree, shrub and insect. Our minds and bodies were educated indoors, and Nature to us was more of a myth than a reality. It was an abstract thing, a meaningless phrase, for I remember my mental image of Mother Nature was far less clear and defined than was my picture of Mrs. Santa Claus.

But now take your mind back to the last night of your first camping experience. Did the cry of the loon scare you well-nigh out of your wits? Did the wailing of the screech owl make goose flesh rise all over your body? No. We loved every sound, and the thought that tomorrow night there would be street car noises, the purr of motors and the clatter of shoes upon the sidewalks, instead of the whispering of the pines, the lapping of the water on the shore and the sleepy call of the katydid, was a sorrowful thought and an unpleasant one.

Why? Because through the camping experience, especially the first one, the child learns the truth about Nature and develops a deep reverence and love for God's wonderful works. The trees, animals and flowers become personalities, friends and companions instead of inanimate objects without soul or life.

Most of the children who come to our summer camps are residents of large cities where they are more familiar with telephone poles than with trees and the only plants or flowers they know are a few varieties of hot-house products which adorn their homes on special occasions. Some do not know a Black-eyed Susan from a honeysuckle, nor a pond lily from a tulip. They know nothing of bird life outside of the robin and sparrow families, as a rule, and their knowledge of animals and reptiles takes the form of horror and fear instead of love and interest. But at the end of eight weeks or so, when they have learned that most snakes are harmless, gentle creatures doing good for the world, and that little field mice are innocent animals, children have a far broader and better viewpoint and understanding of life. Their horizons have widened, their sympathies are extended beyond a small circle of acquaintances and even their imaginations have quickened, for no matter how lacking in fancy a child is, he or she cannot fail to see charm, mystery and romance in a robin's nest or an oriole's throaty call. The sight of an ant's village is bound to impress him with the wonder of God's smallest creatures, and even a bluebell, blooming alone amongst a mass of ferns, cannot fail to inspire him with awe. He cannot long remain oblivious to the charm of a wild rabbit scurrying through the woods, or the beauty of the tall pine towering up toward the heavens. A new world can be opened up to these children in eight short weeks, even though swimming, handcraft, boating and a lot of other activities are included in the program, as well as Nature lore.

It is not the job of the Nature counsellor alone to train them to a wider understanding of the things about them. It is the work of every counsellor and adult member of the camp family. The daily trip into the woods must not be regarded as a formal

study but as a rare privilege and treat, and every minute of the camp program must be designed to develop the child's love of beauty and his svmpathy as well as his body and his mind.

Where can this be accomplished better than at a summer camp? Surely the schoolroom has no advantage. Hearing about a thing is very different from the actual seeing of it, and pictures fall short of the realities. No artist can improve upon Nature's coloring, and few botanists can describe a wild rose so that a child knows it without actually seeing it. Every bit of wild life which can be seen should be studied on the principle that botanical science is more than the pulling of a flower to pieces and attaching long Latin names to the dissected parts and that to know the organism of an animal it is not necessary to cut it open and employ a microscope to learn its habits, its history and its purpose. Our early ancestors and the Indians did not have a minute classification of every bird and beast, and yet who can say that they did not understand and appreciate Nature?

We must aim at developing the heart along with the brain, for unless we do this, Nature study cannot be said to hold any value in our camp programs. If we can make a child as enthusiastic over the finding of a nest of baby robins as he would be over the finding of a bank of shiny nickels, then our work has definite value; and if we can make him look forward to watching the sun set as to a special dessert at dinner, we have truly accomplished enough to make any camp director burst out with a hymn of joy. But we must not be discouraged if we do not accomplish this but be thankful if we can plant the seeds for an appreciation of the more spiritual and beautiful things of our world.

Nature teaches many a lesson which cannot be learned in school. I think it was Wordsworth who wrote, "One impulse from a vernal wood may teach more of man, of moral, evil and of good, than all the sages can." How true this is. And one does not have to hunt for rare birds or flowers to enjoy his vacation but the summer can be made one long, delicious game by finding the beauty in the very shrubs, weeds and ferns which surround the tents, the insects which perhaps drop into the milk when we picnic out of doors, and the trees under which we sit to write our letters home. The mutual dependence of living things—of flowers and bugs as well as human beings—can be brought out in many interesting ways, stressing the spiritual rather than the formal side of Nature and her fascination.

We cannot make second Burroughs or Thoreaus out of our campers in eight short weeks, but we can teach them that there is no sham in the woods, where a pine is a pine; we can give them a little understanding of the soft language of the birds; we can make them sense the infinite peace and make them love the beautiful incense of moss, ferns and pines. We can instill in them such a reverence of Nature that they will long to protect rather than to destroy. Instead of wanting to kill a snake the moment he crawls into view, they can be encouraged to regard him as a valuable officer of the woods who keeps away insects and other creatures who will destroy trees and flowers. Instead of ruthlessly plucking flowers, because they happen to be growing by the wayside, girls and boys learn to leave them alone, adding further to the beauty of the outdoors. Girls especially need to have petty fears about woodland creatures dispelled, and that this is possible in practically every case was proved to me when a little eight-year-old, who was most nervous and afraid of all creatures upon her arrival at camp, brought me one day a huge mud turtle which she had captured. It was alive and fighting, but she had no fear of it and proudly told me all she had learned about her new pet in the Nature classes. "You know," she said, "I used to be such a scary about things, but I don't feel a bit that way now."

On our camp seal there are three white bars—one for character, one for spirituality, one for love of Nature. We devote our every minute, directly or indirectly, to the development of these three phases of life, all of which are equally important and interdependent, for can we truly develop strong, wholesome character without instilling a love for all fellow-creatures, inanimate as well as animate? Can we develop a spirit of unity, harmony and understanding without a foundation of sympathy for the great realm of the out of doors? No! I do not feel that I am exaggerating one whit when I say that the study of Nature is one of the surest and quickest roads to a full and rich childhood and that the "typical" American boy or girl is that one who has gone beyond the walls of his home or school into the great outdoors where he has learned from the best teachers—the trees, the birds, the animals and the flowers—the primal lessons in love, sacrifice, charity and happiness. In the summer camp lies the richest opportunity for this.

Recently Governor Moscow, a Pointer, was crowned as a dog champion. Next month the subject of Mr. Horace Lytle's dog article will be The Pointer.

The Big Wolf of the Timberlands

By WILLIAM MACMILLAN

THE GRAY timber wolf is a carnivore closely related to our domestic dogs, being indeed classed as belonging to the same genus — *Canis*. The family, which includes also the foxes and jackals, has representatives over almost the entire world. Of the various groups, the wolves are the largest, and the species inhabiting northern North America is the most powerful of all the wolves. Possessed of extraordinary powers of endurance, and great strength, he is particularly well fitted to procure the strength-giving flesh that Nature has provided for him.

Little Red Riding Hood has made the wolf famous, or rather infamous. And from early days we have been taught through story and tradition that he is a fierce brute, devilishly clever and cunning. But let us get this quite clear at the outset, the big fellow is not the fierce man-hunter that he is fondly imagined to be. He is clever and crafty, all right, but he is decidedly not a man-eater.

The timber wolf, the specific subject of this sketch, is a particularly interesting study because he is so unlike any other animal in the forest. And compared to some of the more favored ones he does appear to labor under some disadvantages. He can't climb trees; he hates herbs, eating them only when he has to; and he is forced to defend, or divide, his kill with numerous comrades.

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THE LEAN, GRAY WOLVES OF THE TIMBERLANDS

Fleet and intelligent, these animals are difficult to kill, although they have been condemned by man because they destroy stock and game.

It is not generally known that wolves—that is, the larger wolves of which our article treats—are *not* peculiar to this North American Continent. All Europe was overrun by hordes of them at one time, and the doughty Oliver Cromwell seems to have had his work cut out trying to keep their numbers down. The Anglo-Saxons and early Britons made their hunting a sport, but appear to have made little impression on their numbers. Then Henry the Third, of England, went to the extent of offering sizable chunks of land to anybody willing and capable of destroying the wolves.

Like the bear, the gray wolf is heard about much more often than he is actually seen. And many an isolated settler has spent the long winter months in a thrilling matching of wits against those of a hunting wolf on which he probably never once set eyes.

It is an extraordinary fact that wolves are not big travelers but usually spend their entire lives in one locality, covering some twenty or thirty miles in length by about ten miles in depth. They run more often in pairs than in packs, and the clever way in which they will temporarily combine forces in order to encompass the downfall of some hapless quarry is a lesson in advanced strategy.

On the other hand, it must not be imagined that gray wolves spend their lives hunting down big game like deer, caribou or sheep. Their food habits are varied, and they may go for weeks on end with no more important kill than a limited supply of mice, rats, and hares.

A wolf is astonishingly quick to learn; if this were not so there wouldn't be any left today, and there are many old-time wolfers who will gravely assert that the existing wolf is a hundred times more wary and difficult to catch than were his progenitors of a decade back. Accepting this as a proven fact, one is forced to the conclusion that, apart from hereditary knowledge, wolves do actually reason.

There is probably no animal in all the world more hunted than is the lean, gray wolf of the timberlands. Every man's hand and sentiment is turned against him; poisons, guns, traps—all are brought into use for his discomfiture. But in spite of this age-long, intensive war of extinction, it is generally admitted that the wily fellow has won out. And that he exists today in sufficiently large numbers to prove that he has invariably succeeded in perfecting some ingenious method of defense to meet every new emergency.

Like the American eagle, the gray wolf mates for life, making an ideal husband and fond father. Raising a family of from six to twelve husky youngsters is no small task when death lurks in every shadow and around every corner. But raise them the parents do, teaching the doggy-looking youngsters by precept and example to avoid and circumvent all man's devilish schemes connived for their destruction.

It usually takes two years for a young wolf to mature, and in the early part of that period of his eventful life he stands a fairly good chance of being carried off by a bald-headed eagle or pounced upon by some marauding carnivore of another species.

The extraordinary long life of the average wolf has always appealed to the writer's imagination, and he likes to consider it in the light of a perennial challenge to human wolf-hunters. Under ordinary conditions, eighteen years is quite a span of life for even a specially favored mammal. But considering the unfavorable atmosphere surrounding a wolf's mere existence, it is really an astonishing age.

Though we have recently read numerous tales of travelers and trappers being overtaken and devoured by wolves, they are really hard to believe. And until actual proof has been produced of the specific incidents, these fairy tales must be classed with that of Little Red Riding Hood.

The color of a timber wolf's fur runs all the way from sooty-gray to grayish-brown, and the writer has seen some Labrador wolves both pure white and jet black in color.

The wolf's mane is a feature of the animal that appears to be almost totally disregarded by scientists in their otherwise accurate descriptions. This mane—if it could be called that—is long-haired and coarse, starting at from four to six inches behind the ears and running to nothing along the back.

The big wolves of the Labrador run large—well over a hundred pounds in some cases. Certain ones have tipped the scales—by swift mental calculation, of course—at close to one hundred and twenty-five pounds. The huge, white wolf in the photograph—an Alaska wolf, mounted for the Provincial Government museum—weighed well over one hundred and fifty-five pounds and measured sixty inches long, plus a magnificently proportioned brush more than sixteen inches in length.

Naturally enough, the habits and physical characteristics of the big gray wolves are very similar to dogs. Of course there are certain things that you find on a domesticated dog that never occur on a wolf—drooping ears, for instance, or a tail curved in over the back. But they walk and run like dogs.

Though the timber wolf is not gifted with a very wide range of speech, if it could be called that, his howl is deep and soul-thrilling. While the coyote of the plains will emit a succession of short, sharp barks, followed by a short howl, the big gray wolf pokes his snout to the moon and brings up from his toes a long, deep howl that throbs through the silences and floats away on the night winds.

The Mountain Blue Bird

By WILLIAM L. AND IRENE FINLEY
Of the National Association of Audubon Societies

(ILLUSTRATED BY A FULL-PAGE INSERT IN COLOR FROM A PAINTING BY R. BRUCE HORSFALL)

IN THE level desert of gray sage and greasewood stood two old juniper trees, gnarled and stunted, one of which had a dead and broken top. With a glance one might compass the silent stretch to the far reach of the horizon, so lacking was the place in life. Indeed, at mid-day under the beating sun it was lifeless until out of one of the trees fluttered a bird gorgeous in a dress of turquoise-blue. He hovered like a big butterfly, dropped to the sand, snapped up a grasshopper and flew back to a hole in the dead juniper where a mother mountain bluebird was hatching six blue eggs. It is the custom of the father blue bird to feed the mother on the nest and help care for the children.

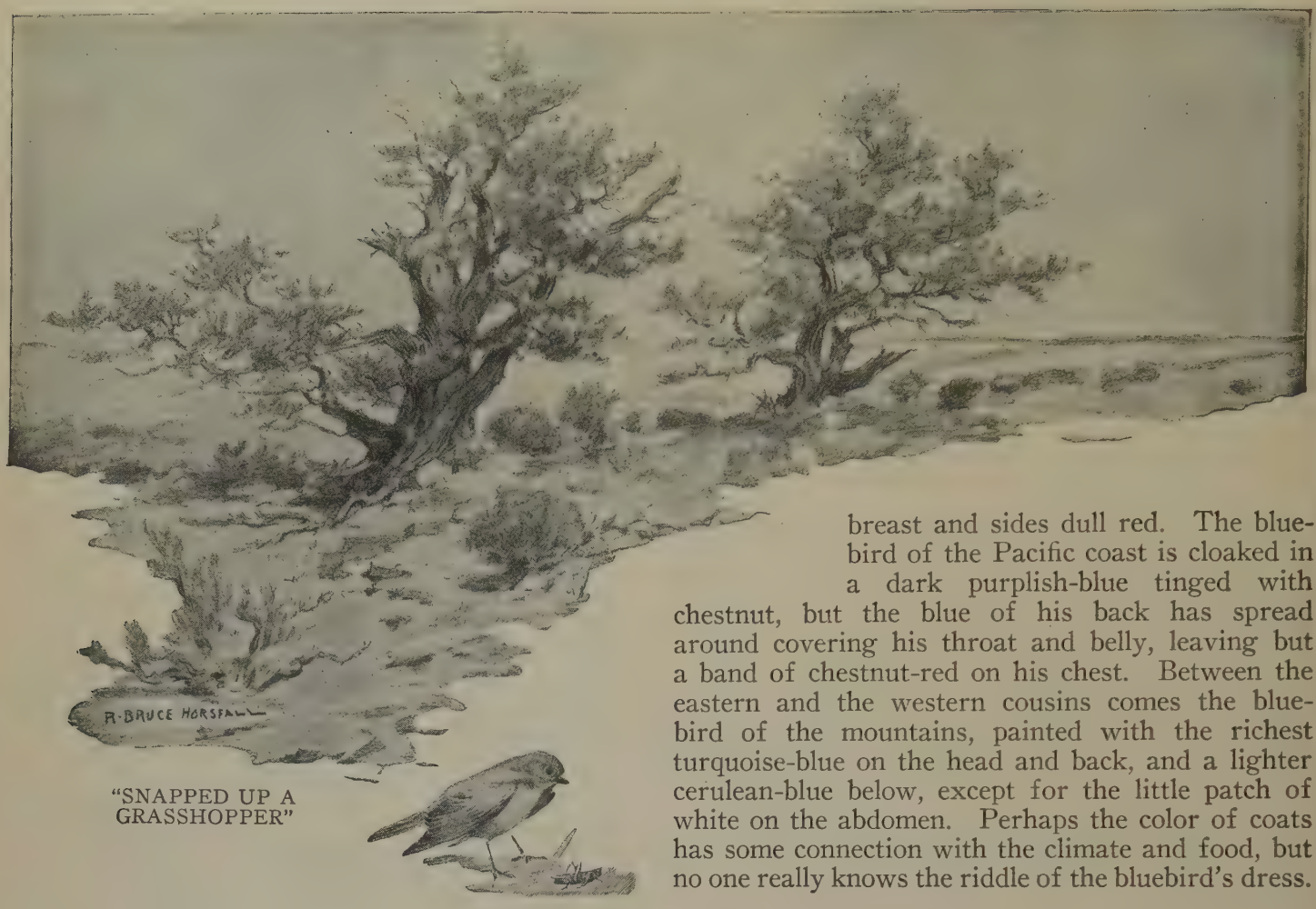
It is this preference for the highlands where areas are unsettled that accounts for the mountain bluebird not taking to civilization as much as his cousin of the east or the western bluebird of the Pacific slope. Yet in recent years he is coming down more from his high altitudes because children of the Rocky Mountain states have been building and putting up bird houses. This beauty of the high plateaus is easily lured by a modern home, as his cousins are. He has just been waiting for an invitation; and what a gentle and charming companion he makes.

"When Nature made the bluebird she wished to propitiate both the sky and the earth, so she gave him the color of one on his back and the hue of the other on his breast, and ordained that his appearance in the spring should denote that the strife and war between these two elements was at an end. He is the peace-harbinger; in him the celestial and the terrestrial strike hands and are fast friends. He means the furrow and he means the warmth; he means all the soft, wooing influences of the spring on the one hand, and the retreating footsteps of winter on the other." wrote John Burroughs.

But Mr. Burroughs had in mind the bluebird at Riverby, his home on the Hudson. If he had written of the mountain bluebird, he could hardly have mentioned the earth, for the cloak of this bird is without a trace of earthy trimming. He revels in the high mountains. He lives from the roof of the Rockies across the stretch of high plateaus to the Cascades and the Sierras, and from the waters of the Yukon to the tablelands of Mexico. Indeed, one of the first places where he was discovered was Great Bear Lake, far up in the northern end of our continent, and for a time he was known as the Arctic bluebird.

YOUNG BLUEBIRD
His speckled breast would indicate that he is a close relative of the thrushes.

If we could but turn back the pages of time to the place where bluebird annals began, we might discover the cause for the various styles in bluebird coats. The speckled breast of a young bluebird would indicate that he is a close relative of the thrushes. Yet the bluebird has departed from the earthy-brown of the thrush and has come down the long trail of time in this showy coat of blue. But who can explain the causes for the different coloring in our three bluebirds? The bluebird of the east has the bright blue upper parts, with throat,



"SNAPPED UP A GRASSHOPPER"

breast and sides dull red. The bluebird of the Pacific coast is cloaked in a dark purplish-blue tinged with chestnut, but the blue of his back has spread around covering his throat and belly, leaving but a band of chestnut-red on his chest. Between the eastern and the western cousins comes the bluebird of the mountains, painted with the richest turquoise-blue on the head and back, and a lighter cerulean-blue below, except for the little patch of white on the abdomen. Perhaps the color of coats has some connection with the climate and food, but no one really knows the riddle of the bluebird's dress.

An Appeal from Afar

TO THE members of the American Nature Association comes the voice of an embattled conservationist from far away, asking a word of encouragement and advice. F. Vaughan Kirby, Game Warden of Zululand, South Africa, writes:

"I am just now in the throes of a hard struggle with members of the new Nationalist-Labour Government who desire to abandon all our game reserves and thus exterminate the last of the once magnificent fauna of the subcontinent.

"I have the support of the Provincial Administration, of course, and of the various museum authorities, as also of a section—alas, a very small one—of the public, and I have just returned from a big conference held in Maritzburg, at which the subject was discussed, but I fear the champions of blood-lust and slaughter will win the day!

"If only we can stave off the evil day until our Prince of Wales comes out, I believe he might be able to turn the scales in our favour, and I am sure he will do so if he can.

"I tried to shame them at the conference by pointing to the example of the United States, and how no efforts are being spared to protect their wild life throughout the Continent. I told them that we hold no God-given monopoly of the wild creatures of this land, and are but trustees for a future generation; we shall be sadly lacking in our duty if we fail to honour that trust.

"But it all avails nothing, and now my only hope is that in the press of work in the coming session of Parliament the matter may be shelved till good friends in the States can get a word in, and the Society for the Preservation of the Fauna of the Empire in England can make their voices heard."

The officers of the American Nature Association have written their word of endorsement and offer of assistance. The "good friends in the States can get a word in." Mr. Kirby's post office address is Nongoma, Zululand, South Africa, and he will be able to "carry on" the better for a helping word.

American Azaleas

By STEPHEN F. HAMBLIN
Director, Harvard Botanic Garden

WE HEAR much of the beauty of the Azaleas of the far east; the one sold by florists at Easter and planted in the azalea gardens of the south is one of the most showy of shrubs when in bloom. Yet our own native azaleas are as beautiful as these, and far more easily grown.

The word "Azalea" was given by Linnaeus in 1735 because he was told that the American plants grew in dry places. As there were no native azaleas in Europe, this story seemed all right. The American plants were separated from Rhododendron because the leaves fell off in early autumn, and the flower has a slender tube split unequally into two upper and three lower petals.

When the azaleas of Asia became known there were found many with evergreen leaves and most of the deciduous kinds had the regular five-parted bell of the rhododendron blossom. Although the difference between American azaleas and American rhododendrons is very plain, the Asiatic species are hopelessly intergraded, so botanists call them all rhododendron. This gives our azaleas two names, the rhododendron preferred by science, and azalea by gardeners.

Before we pass the stage of admiring our azaleas and decide to grow a few at home, we must know one important thing about their culture. They are as fussy about their food as a dyspeptic in a strange country. They must have a moist, cool soil, consisting mostly of leaf mold or humus, and the moisture must be acid. Where the natural rock is limestone, or where rainfall is less than twenty-five inches per year, it is as hopeless to grow them as ducks in the Sahara. Moist acid humus is their diet, with no fertilizers of any kind save peat or rotted leaves, and irrigation water must be rain water, unless the river water is definitely not alkaline.

This means that azaleas can be grown in our country from the Appalachians to the Atlantic coast, and westward to the prairies of eastern Ohio and Kentucky, and northward through Michigan and Minnesota. From Cleveland to Denver it is useless to try them. In well-watered valleys of the northwest they also thrive. Thus in nearly two-thirds of our country they are not a success, for soil and rainfall are not suitable. We hear now, however, that the soil can be doped to grow any acid-loving plant by use of aluminum sulphate or similar salt.

Perhaps the best way to learn our native azaleas is to take them by date of bloom. There are some six distinct types, with varieties or related species in each group.

SPRIG OF AZALEA
The flowers of this species appear before the leaves are fully developed.

Earliest of all, and most distinct, is our Rhodora (*Azalea canadense*), matched only by one other shrub, from Japan. So different is it from other Azaleas that it was once put in a group (*Rhodora*) by itself. Emerson wrote sixteen lines to it, and the poem is more widely known than the plant. In swamps and bottomless bogs it bursts forth in early May in a blaze of little magenta blossoms on the leafless twigs. Once seen it is never forgotten. It is the most lowly of azalea plants, hardly knee-high, and the little flowers are very two-lipped. The rest of the year it is unnoted in the bushes of the swamp. It is as easy to grow as any azalea, and dealers in native plants sell it. In a moist, wild garden it is an essential spring feature.

Fully as early is number two of our list, Pinkshell Azalea (*A. vaseyi*) from the Blue Ridge of the Carolinas, a rare plant in nature, but now much seen in gardens. Little plants less than a foot high bloom freely in early May, though in time it makes a bush more than ten feet high. The flowers are a clear pale rose, some darker, and on some bushes pure white. It is as hardy and easy to grow as any azalea, giving the color effect of a soft pink rose, as Killarney or Dorothy Perkins. By its color and date of bloom, as well as its large split flower, it can be told from other azaleas.

Immediately, from mid-May to mid-June, in northern states, come the deep pink ones, the Pinxterbloom (*A. nudiflora*) and its several relatives. This is the most widespread of our azaleas, grow-

ing from Massachusetts to Texas in proper soil. The flowers are an intense pink, from dark to pale on different plants, faintly fragrant. The new leaves begin to appear also just at this time, which is not the case with *A. vaseyi.* Also the flower is much more slender in tube, and the color is a more intense pink, though not always darker.

PHOTO BY L. W. BROWNELL

MASSED GROWTH OF PINK AZALEAS

This is the most widespread of the Azaleas, blooming from mid-May to mid-June.

This group entertains the botanists, for there are several very similar plants. *A. canescens,* Piedmont Azalea, is found in the southern states, the leaves very downy and coming much later than the flowers. *A. rosea* is much the same, but from New Hampshire to Tennessee, with thin downy leaves, opening with the flowers; while *A. alabamensis* has downy leaves, smooth buds, and white flowers. The whole group is most worthy of growing, and gives the deep pink flowers of our May woods. It has been crossed with several of the Asiatic species, and helped to make the Ghent hybrids, which are not too well suited to our country. This species will be the basis of many American hybrids when someone undertakes the work.

Almost the same day flaming red, orange and yellow blossoms appear on other bushes. If an American plant it is the Flame Azalea (*A. calendulacea*), a bush taller than your head, wild from Pennsylvania to Georgia, but easily grown in the north. The chief difference is the flaming colors, from deepest orange to palest salmon yellow, on most bushes a garish orange. Also, the flower tube is very long, and the stamens stick out even longer. It is the most barbaric color show of any native shrub, and not even several similar Asiatic species can beat it in intensity of color or freedom of growth. Anyone who has seen the flaming hillsides of western Virginia in spring will carry always a color plate of this plant. It has been crossed with our pink species, and with Asian species to make Ghent hybrids. Except as its unique colors go into the offspring, the hybrid is much like the other parent.

Before this fire of color is quenched the Sweet or Tree Azalea (*A. arborescens*) gets into action, and its pure white, fragrant flowers help tone down the azalea bed. Eventually the plant may reach twenty feet, but it looks much like a white-flowered *A. viscosa,* save that the leaves are wholly hairless both sides, a state not common with azaleas. Though native from Pennsylvania southward, it is perfectly easy to grow where our northern kinds thrive. It has crossed with the Flame Azalea, with pale blossoms marked with the flame colors, a move toward relief in azalea fires.

Lastly, comes old Swamp Azalea, or Honeysuckle (*A. viscosa*), the tail end of the procession on the globe, blooming in late June and all July in the north. The bush is not much different from the previous three, but in straggly clump, ranging all over our eastern states where the land is swampy or very wet and peat-sandy. The flowers are pure white or faintly pink, very sticky outside, and exceedingly fragrant. The leaves are fully grown at time of bloom, so it makes more finished cut-flowers than the early naked kinds. There is plenty of nectar at the bottom of the flower for children to suck from the plucked tube. Its value in possible hybrids is fragrance and lateness of bloom, as well as ease of culture.

Though Nature has been liberal in giving us our east American azaleas, man will doubtless improve them for further garden use. The several species of the Pacific slope are yet but little known away from their home. Possibly special training of the plants, and liberal aluminum sulphate treatments may make azaleas some day as common as roses.

This, then, is the succession of our natives—little magenta Rhodora, soft rose Pinkshell, bright rose Pinxterblooms, the flaming Flame, then the white Sweet, and in early summer the Swamp White.

Blue and Copper

By N. M. PAIRPOINT

THERE is more than one point of view about gardens, as there is about most things. To some, gardens represent only turnips and early radishes; to others, perfume is of more value than bloom; still others revel in color harmonies, where a group of flowers flaunting some color that jars with its neighbor's tints causes positive pain. But the Nature lover who is going to get the most out of life will appreciate all these things and find other interests and inspirations besides.

Gardens bring many visitors. We see a flickering, erratic flash of violet-blue over the first flowers of the hepatica and bloodroot, like a square inch of the sky above taken wings to itself come to examine our efforts here below. It is the Spring Azure butterfly arrived for the season.

This group of butterflies is well named the Gossamer-Winged. So frail and delicate are they that the slightest touch mars their beauty. The first of the season to emerge from the chrysalis, they are only a few days later than those that have hibernated in some crack or crevice throughout the winter.

Through this faunal region there are four different blue butterflies all about the same size, and so much alike that it is difficult to tell them apart when they are flying. They are the Spring Azure, the Silvery Blue, the Scudder's Blue, and the Tailed Blue. Blue is a rare hue for us to find among butterflies and moths. Each section of the world has its own characteristic colors in these insects. Ours are browns and grays, and the blue butterflies find their highest development in South America.

If one of these tiny living creatures is seen under a good magnifying glass, the perfection of its details and finish is almost startling. One gasps in awe of Nature's handiwork. Nothing Nature ever makes is too small to be absolutely perfect, no slighting of detail, nothing slurred over.

This little Spring Azure shows us one of those marvelous changes that occur in the butterfly and moth world that scientists have not yet explained clearly. As the season advances and the successive broods develop, their markings vary. At first they were supposed to be different kinds, but it has been definitely proved now to be a case of variation in the same creature. Temperature and moisture have been suggested as the cause. As the season advances, the dark edge of the wings on the upper surface becomes wider until, in the southern states, the males of some of the broods become entirely dark, losing the blue tint altogether. The markings on the ashen gray underside of the wings become heavier in some parts of the season. It has been proved that some seasonal difference causes the variation but that it is all the same insect.

THE WANDERER

One of the most widely distributed of butterflies, found from coast to coast.

The caterpillar of this butterfly is a minute little thing, slug-shaped and green, and feeding on the terminal leaves and flower petals of a great variety

of plants. Fifteen different plant families are known to supply food, but the Cornus seems to be the favorite in the spring. The chrysalis is a purplish brown and closely attached to the stem of some plant, passing the winter in this stage.

THE SPRING AZURE

This little butterfly shows one of the marvelous changes of its world.

One day while we are watching the little violet-blue Spring Azure, we shall see it joined about the end of April or the early days of May by the brown, black-spotted American Copper. This flashes and glitters as the sun falls on its wings, like a scrap of burnished copper flying back and forth over the flowering strawberries.

Only a trifle larger than the Spring Azure, and belonging to the same class of gossamer-winged butterflies, these Coppers are much more energetic and positive in their method of flight. If the little Copper was as large as some of the swallow-tails of midsummer, it would be one of the most gorgeous that we have, but even the handicap of its minute size fails to hide it.

The American Copper is one of the most pugnacious of butterflies, and, like many little people, knows nothing too big to be attacked. A pair of them seem to take possession of a limited space of lawn—a patch of roadside, or some sunny bank beside a still pool—and they appear to feel they have a self-imposed duty to guard the selected spot against all comers. They are not fussy whether the object

AMERICAN COPPER

One of the most pugnacious of butterflies, knowing nothing too big to be attacked.

of their challenge is strictly their own size or not, but fly at blundering bumblebees and even wasps.

The caterpillar of this butterfly feeds on the common sorrel, both leaves and flowers, and is so small that it is rarely seen, except by those who

purposely look for it. The butterfly is everywhere all the spring and summer, and the Nature lover would miss an old friend if the little American Copper was not ready to fly at him through the summer months.

When we leave our own gardens and wander through Nature's, where the footpath leads through the alder woods beside the brook, we shall meet the American Copper's cousin, the Wanderer. A trifle larger than the American Copper, and not quite so bright in color, this member of the family also has the habit of staying in a very limited space. It is, nevertheless, one of the most widely distributed butterflies that we have, being found from coast to coast and from north to south.

This little butterfly upsets all the previous facts about butterflies and their caterpillars that we have learned. Nature has a habit of doing this, to prove to us how little any of us really know about her ways.

Most moth and butterfly caterpillars are vegetable feeders, and the adult insects themselves live on nectar they gather from the flowers, although many of them add water and fruit juices to their diet. But in the case of the Wanderer the caterpillar is carnivorous, living upon the woolly plant lice, those bunchy, white, cottony masses that we see on plants, and that suck the sap and life from everything they attack. The various forms of aphids are among the worst pests that the gardener has to combat and this minute caterpillar renders good service by devouring quantities of them.

The infant Wanderers seem to prefer the woolly aphids that live on the alder, but they also eat the other varieties found on the ash, beech, and maple. These aphids exude a sweet substance called honeydew, much loved by ants, who keep herds of such insects and carefully tend them in order to gather the sweets.

The butterfly Wanderer is seldom seen on flowers, although it sometimes alights on the upper surface of a leaf, but seems to join the ants in feasting on the honeydew from some aphid-infested plant.

To have a garden and love it, and not to know all the inhabitants of it, who live their lives among our plants, and those others who come over its boundaries as visitors, is to lose half the pleasure in our possession. A garden is a plot of ground in which many worlds meet, and combine, some helpful, others antagonistic; where a reflection of all the activities of the universe is enacted in miniature for our pleasure and delight.

The Chachalaca

THIS photograph of a bird brought back from British Guiana to the American Museum in New York by the Beebe Expedition indicates the ease attending the domestication of the chachalaca, a gallinaceous bird which inhabits tropical and subtropical America from northern South America north to the Rio Grande region of Texas.

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In the wild state these birds, like many of this tribe, are quite wary. They live in small companies, and it is their custom to greet the dawn from some such vantage point as the elevated branch of a tree. Here the males send forth a loud and rather harsh call, which carries far in the clear morning air and is answered by their rivals. Apparently they are assisted in this vocal performance by the peculiar construction of the trachea, which before it enters the chest cavity is prolonged in a long loop extending backward past the lower end of the breast, and returning to enter the lungs at the usual point.

The chachalaca spends much of its time in the trees. It usually nests in trees or bushes, laying from three to five eggs of a creamy-white color, and rather small for the size of the bird. The individual here shown is a young one in rather ragged condition, but the old birds with their dark-olive plumage, brightening to a lustrous green on the tail, are very handsome. They are extensively tamed and then become so familiar and affectionate at times as to become almost a nuisance.

The Water Lily

By E. FRED ROWE

AMONG all the gems of Flora's Kingdom probably none surpasses in loveliness those modest flowers that border the still-running brooks, that float on the surface of quiet ponds, or hide themselves in marshes and swamps.

These places are a vast open storehouse of treasures. You can follow your own sweet fancy, wander where you will, gathering the gems as you please—Nature puts no guard around them—and your only adventure or mishap may be damp clothing, or a wet foot, or an ankle-deep slip into the oozy marsh.

June is said to be the month of roses, but to the rambler it is the "month of water lilies." What a miracle Nature performs when the black, slimy, filthy bottom of an almost currentless pond is changed by her processes into a spotless, glistening, fragrant flower—so pure, so dainty, that one hesitates to pluck it.

The native water lily (*Nymphaea odorata*) of the eastern states is white. Another native variety (*N. odorata rosea*) is commonly known as the Cape Cod pink. In the western part of the country, especially in the small lakes, a white species (*N. tuberosa*) grows quite freely. The water lilies found in the southern states are both white and yellow, as are those that are native to South America. *Nymphaea flava,* a yellow species, is a native of Florida but will grow well even as far north as New York City. The south also has a white native species known as *N. odorata gigantea.* The Swedish lily (*N. caspary* or *N. alba* var. *rosea*) is light pink.

Around small northern lakes and ponds one may find a plant that is locally called a "yellow water lily." While this plant does belong to the *Nymphaea* family, it is known botanically as *Nuphar advena* and commonly as "Spatter Dock."

From Australia and Zanzibar, from India and Africa, from China and the Argentine, and from the islands of the Seven Seas, travelers and exploring botanists have brought home species of water lilies rather than hoofs and horns of big game. In their "game-bags" came varieties with blue flowers, red flowers, light rose or pink, as well as the more familiar white blooms that resemble our native water lily.

ANYONE CAN BUILD A WATER LILY POOL

Even the tiniest garden has all the requisites for growing lilies.

Almost half a century ago some of these rare species fell into the hands of M. Latour-Marliac, a French genius, who at once began to hybridize, or cross-breed them, to secure new varieties. His success was pronounced, and even today some of his varieties are not surpassed by later introductions. Four of M. Marliac's "children" are known as *Nymphaea marliacea albida,* white with yellow stamens; *N. marliacea carnea,* flesh-pink; *N. marliacea chromatella,* canary-yellow; *N. marliacea rosea,* deep rose. In 1908 M. Marliac presented a trio of hybrids—Comanche, apricot turning to copper; Masaniello, rose-pink and carmine; Graziella, yellow-red deepening to orange. One of Marliac's very earliest successes was the light yellow variety Seignoret, which came in 1879. When the flower is a day or two old it shades to pink, and becomes a deep carmine before falling.

A GEM OF FLORA'S KINGDOM

This lily (*Nymphaea marliacea carnea*) is flesh pink in color.

Comparatively few, possibly not even a half dozen, American hybridists have brought out new varieties of water lilies. Americans want things to come quickly; water lilies demand time, so the Old World, which seems to move slowly, has produced most of the new varieties. However, there are three outstanding figures in American water lily culture—the late William Tricker, of New Jersey, George Pring, of the Missouri Botanical Gardens, and August Koch, of Chicago.

Within the past five years Mr. Pring has brought out six valuable new kinds—Stella Gurney, light rose-pink; Castaliiflora, pink; Mrs. Edwards Whittaker, lavender-blue; General Pershing, two shades of pink; Mrs. George H. Pring, pure white; Wilson Gigantea, dark lavender-blue.

Mr. Tricker hybridized many varieties, and at the present time five of them hold high places in water lily commerce. This quintette includes Panama-Pacific, reddish-purple; Mrs. Woodrow Wilson, lavender-blue; Mrs. C. W. Ward, a deep rose-pink, almost red; Pulcherrima, with light blue flowers ten inches and more across; Pennsylvania, a much-deeper blue and a larger average bloom than any other similar variety.

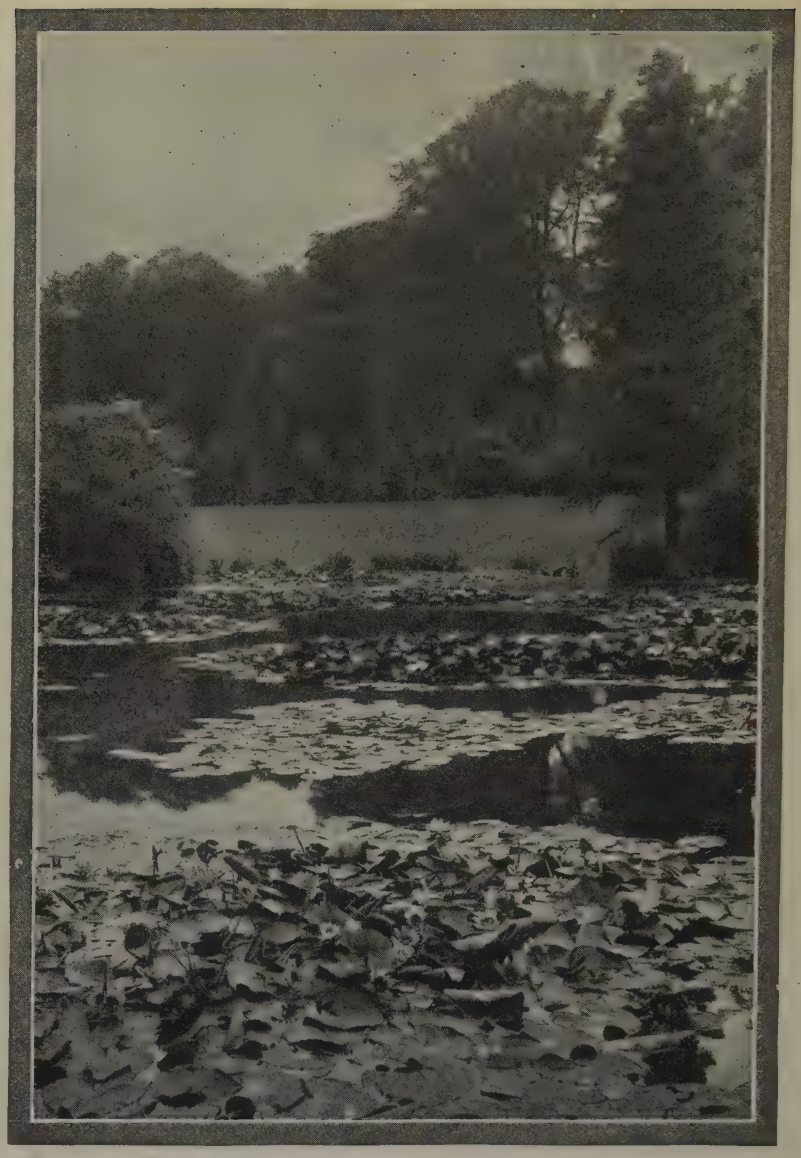
A trio of popular varieties was introduced to America by Mr. Tricker, but not hybridized by him. One of these, the light-blue variety Daubeniana, is an extremely free bloomer; in fact one small plant has borne three score flowers at one time. William Becker, the second of the trio, has deep purple petals and stamens, with yellow center. The third member is August Koch, named after the chief florist of Garfield Park, Chicago; the sepals of this variety are purplish-lilac and the petals a pale wistaria-violet; the flowers are about seven inches in diameter and will remain open nearly a week.

Incidentally, Mr. Koch has done some work in hybridizing, and time will produce other varieties from the experiments he is carrying on.

Water lilies naturally fall into two chief divisions: The tender varieties, or those that come from

warm climates, and the hardy varieties, or those that will survive a low temperature, provided the roots are not actually frozen or disturbed by ice. There are in commerce practically an equal number of varieties in each class, so the lily fancier must settle for himself whether he wants his display in natural ponds and large pools where the tubers may remain undisturbed, or whether he is willing to remove the tubers on the advent of cold weather.

Tender water lilies are also divided into two classes; day bloomers, or those that open in the early morning and close in the late afternoon, and the night bloomers that display their glories after the evening shadows come. True to their nature, the tender varieties thrive best in extremely hot weather, giving more flowers and more brilliant colors. The flowers of tender lilies are carried on longer stems than are those of the hardy sorts and so are more desirable for cutting.



ON THE SURFACE OF QUIET PONDS
To the rambler June is the "month of water lilies."

If people only realized how easily water lilies can be grown in the garden, the flowers would be as familiar as asters or sweet peas. Even the tiniest garden has all the requisites, and lilies have been grown successfully on the roofs of city sky-scrapers. A tub or tight half barrel of water, a little good soil, and sunshine, are all that the gardener needs for a modest attempt. After the first summer, when the water lily "bug" really gets you, will come the longing for more tubs —or a pool!

Any man who can handle a shovel and mix the cement can build the pool. Forms are not needed. Outline the pool as you wish it; dig a trench eighteen inches deep and six or eight inches wide, keeping the sides straight. Fill this trench with concrete made of waterproof cement and stone. When this has hardened, remove the earth inside the wall, sloping to a center depth of three feet. Tamp the bottom thoroughly, then pave with old brick or stones, leaving half an inch or more space between each paving piece. Spray the brick and stone with water, then pour in a mixture of cement and sand, covering at least an inch above the bricks. This bottom mixture should be one part cement and two parts sand. The side wall is in the same proportion plus the small stones added.

The water lily tubers are planted in boxes of soil, which are placed on the bottom of the pool; then the pool is filled with clear water to within an inch or two of the top. This level should be kept during the whole season by "turning on the hose" as evaporation takes place. A dozen gold fish will add to the charm of the pool, and keep it entirely free from the larvae of the mosquito and other insects undesirable for various reasons.

Colorful and fascinating, the Surf Scoter has been selected as the subject of R. Bruce Horsfall's colored painting in the June issue of NATURE MAGAZINE. It serves to illustrate an absorbing article from the facile pen of Ben Hur Lampman.

Where the Bottle Stoppers Come From

By NELSON COURTLANDT BROWN

SUMMER styles in winter, beautiful blue water, Monte Carlo, palms, white villas with red roofs, Capri, Arabs in beard and burnoose, leisure and climate. All these, and more, are products of the shores of the Mediterranean, pictured in color and rotogravure to lure the stay-at-homes to the travel bureaus or to day dreams.

Under the warm, bright skies of Spain and Portugal, in southern France, Italy, Sardinia, Algiers, Tunis, the north coast of Africa and the eastern shores of the great azure sea, there grow forests like old, gnarled, bushy-crowned apple trees. Every seven or eight years a swarthy native flashes a sharp knife lengthwise up one of these trees for about five feet. The knife glints in the sun as it girdles the tree above and below this cut. Deftly a prying tool slips in and the cork oak has yielded its bark to stopple our bottles, to line our ice chests and to serve us in many ways that invention has devised.

Treedom knows more than three hundred varieties of oaks, but only one of these furnishes bark having the qualities of cork. This is an evergreen oak of the shores of the Mediterranean which for one hundred and fifty years or more, with careful treatment, will give up regularly its coarse, thick, light, soft and somewhat spongy outer bark.

The fishermen of ancient Greece and Rome buoyed up their nets with cork, just as do the seiners of today. It provided stoppers for jugs and earthern bottles. With the introduction of glass in the fifteenth century, the cork oak was called upon even more to supply stopples for these new and widely used containers. Inventive genius of modern times

LIKE OLD, GNARLED, BUSHY-CROWNED APPLE TREES

The orchard of potential bottle stoppers in the south of France where cork oaks bask in the Mediterranean sun.

has made even greater demands upon this gift of Nature and an important industry has resulted.

The Spanish provinces of Catalonia, Andalusia and Estremadura and the Tagus River valley of Portugal are the two greatest centers of cork production and manufacture. Here the forests resemble closely the evergreen oaks of our own southeast and California valleys. The trees are not tall, rarely boasting more than fifty feet, and generally grow wide apart. They prosper with irregular abandon, growing from eight to eighteen inches through the trunk.

July and August are the months for removing the bark, which then yields readily. Since the clear trunk of the tree from which the cork overcoat is taken is seldom more than fifteen feet high, the bark from each tree is somewhat limited. On the larger trees the limbs are often peeled, giving a high quality of cork. The Spanish Government, however, forbids taking the bark from trees less than five inches in diameter. In the average cork orchard the trees number between thirty and sixty to the acre, compared with between one hundred and two hundred trees in our own white and red oak forests.

REMOVING THE CORK BARK

Much deftness is required to strip the cork oak of its overcoat.

BARK OF THE CORK TREE

On the left a piece of the first stripping from the tree. On the right the dried bark.

Undaunted by having lost its bark, the cork tree sets about immediately to grow another layer. In seven or eight years this new coating can be harvested, and the forests can be, and are, managed according to rotation of crop and the best methods of forestry. Young trees produce the best quality of cork save for the first stripping. This virgin bark is only used for granulated cork, being ground up and pressed together in blocks or sheets for refrigeration uses.

After the cork bark is harvested it is dried in the open. Only experienced workers do the task of stripping. Following the harvest the bare tree trunks become deep red in color, making a spectacular sight in the harvesting season. The bark varies from one-half to two and one-half inches, depending upon the size, age and vigor of the trees, and each tree yields from forty-five to fifty pounds according to these same factors. Once dried, the strips of bark are taken to the manufacturing centers, where each piece is flattened out by a steaming or hot-water process and the rougher bark is scraped.

From refrigerator cars to cigaret tips, cork has come to assume an essential place in our daily life. Light, elastic, compressible, resisting air and liquids, reluctantly conducting heat and cold, it is made into floors, and pincushions, bath mats and washers, carburetor floats and fishing rod handles, mattress stuffing and penholders, furniture and insulators, life belts and inner soles.

Some interesting experiments are now being carried on at the University of California, and cork oak forests in America are certainly possible.

The Black-necked Stilt

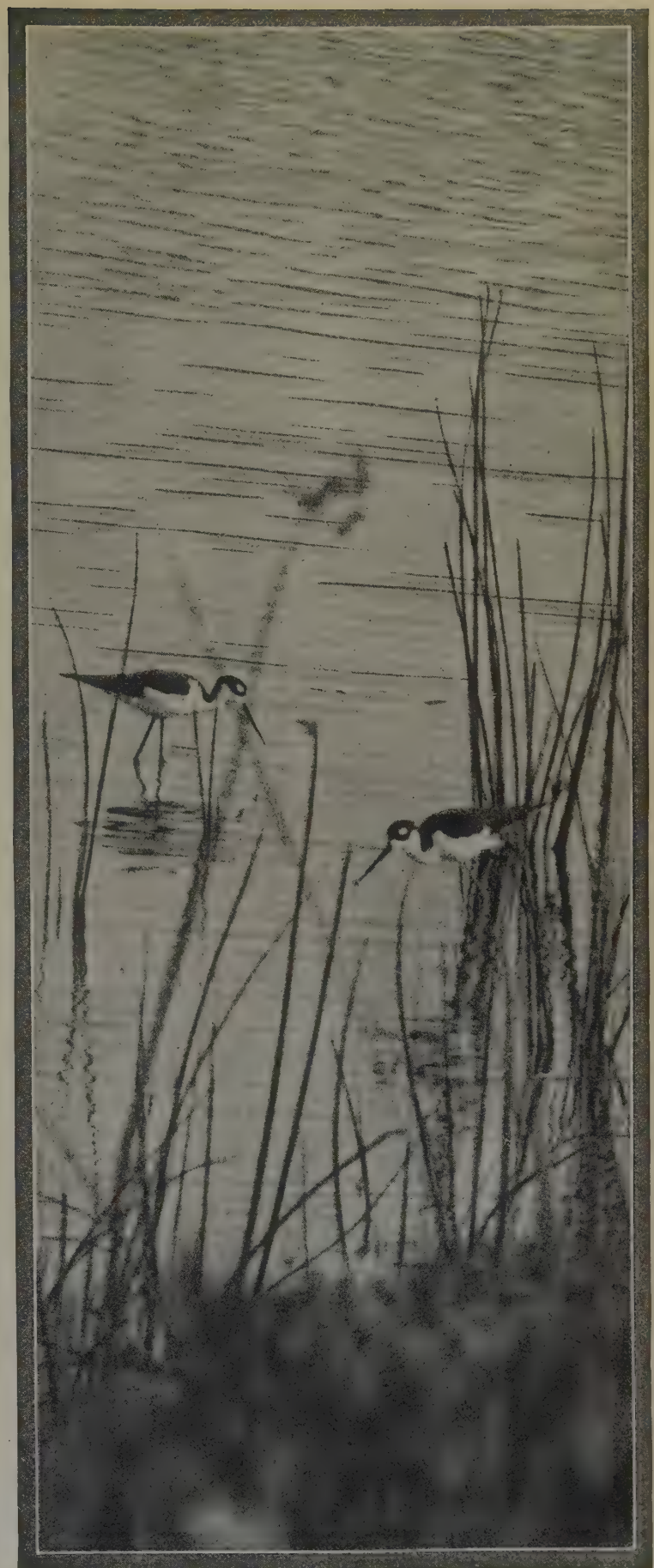
By WILLIAM LEON DAWSON

PROTECTIVE coloration is by no means a universal device. In hundreds of cases Nature makes no attempt whatever at concealment, and in many cases she appears rather to court publicity. It is so at least with the Black-necked Stilt; and you could as soon hide a black-and-white cat on a billiard table as conceal a Stilt feeding along the edge of a pond. Nature intends you to see and to admire this exquisite absurdity, or else she means to disarm you of hostile intent through an entertaining monkey show. Black-and-white are sober colors for a clown, but red legs help; and the lurid language which accompanies the scarf-and-stilt dance makes the vaudeville sketch presented by Mr. and Mrs. Himantopus one of the cleverest on the western circuit.

Consider, I pray, those legs, bare to—no, *not* to the knees; no bird would be so immodest as that—but bare to the body plumage beneath which are concealed, forever, the upper lengths, the femurs, of the nether limbs. The hinge joint which we are tempted to call the knee is really the *heel,* and the lower portion of the "leg" is the metatarsus. But take it as it stands, metatarsus and tibia, your Stilt has from eight to ten inches of effective leg, and this although his actual body, exclusive of neck and tail, is only four inches long! With this equipment—stilts in very sooth—the Stilt will essay to wade in water up to a foot in depth, or he will retrieve dainties from the bottom of a pond having ten inches of water.

Like many other successful clowns, the Stilt is deadly serious to appearance, and so expert in managing his bizarre apparatus that he will do a dozen tricks and stunts you would never suspect him of. For example, he can wade about in four inches of still water and withdraw his foot so deftly after each step that the surface of the water is scarcely broken, and the muddy bottom is unresentful. He can charge about the sky like a rocket, and use his long legs so effectively for a rudder that you begin to wonder why birds need tails at all. Above all, he can stalk about in the bristly edges of a swamp unmindful of the pricks and thrusts of the grassy spear-points, where other wading birds are lost or driven to flight.

But these things are all in the day's work. It is when an observer stumbles upon a courting scene that he gets some idea of the bird's agility, and the real entertainment is provided only when



"NATURE INTENDS YOU TO ADMIRE THIS EXQUISITE ABSURDITY"

there are eggs or young to defend. In early May I have seen Sir Stilt running at his enamorata as though he would transfix her with his pointed beak, while she, not less adroit, would step aside, or else leap suddenly into midair. Once the lady played a joke on the swain, for instead of jumping, she ducked suddenly, went souse, and almost under, in three inches of water, while the male swept clean over her with the force of his up-opposed rush.

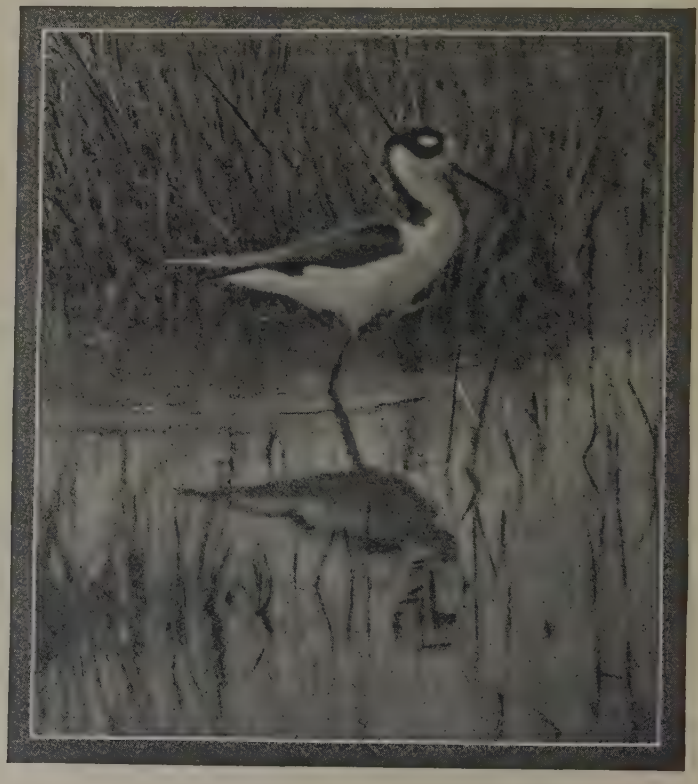
When a nest is threatened, the parent birds shriek, mockingly or coaxingly, and engage every known device, and some new ones, for the distraction of attention. One of them falls, the female most likely, as though her pipe-stem legs were suddenly broken; but when you see that this accident befalls her every third or fourth step, your pity hardens. Neighbors are summoned, while the male bird leaps violently into the air, and dances about as though he had stepped on hot ashes. At a little remove, another bird lifts a wing and lets the wind towsle it about to prove to you that it is broken and useless, and that the owner is a fit subject for seizure and consumption. Others, again, lift both wings and do a shimmy, in which both legs and wings appear as removable appendages. This is which I have called the scarf-and-stilt dance, for the black wings look like a Spanish mantilla, draped now this way and now that in wind-blown grace, while little red stilts are broken up and discarded with reckless abandon (but are, somehow, immediately replaced).

Stilts are loosely gregarious at nesting time, because their exact require-

FROM SWAN TISSUE PRINT BY F. E. D. BROWN

"DEADLY SERIOUS TO APPEARANCE"

"CONSIDER THOSE LEGS!"



"A GINGERLY APPROACH IT IS"

ments are not easily met, and when once found are available for an indefinite number of birds. Perhaps the most favorable advantages offered in America are found in central California, typically near Los Baños, in Merced County, where great tracts of grazing land are subjected to a partial and systematically controlled overflow of waters during the months of May and June. The residual ponds left at the end of each season nurse the stock of an abundant paludal life, and when the water is turned on in alternate fields in early May, Nature's pulses beat at fever heat. Stilts vie with Avocets for the possession of choicely watered stretches; Killdeers and Wilson Phalaropes hover about the margins or dip in the smaller plashes; while Black Terns colonize in the deeper open portion; and Tricolored Redwings, Bitterns, Ibises, Night Herons, and a score besides, seek the shelter of the crowding tules. But the Black-necked Stilt dominates the scene. Everywhere his strident voice rises in protest. The clamor is most incessant, *pep, pep, pep,* or *krek, krek, krek,* endlessly repeated, until the nerves of the explorer are almost ready to explode. The notes are coarse and harsh, although rather low-pitched; and it is no exaggeration to say that a half day in the Stilt marshes is almost sure to give the novice a headache.

The Stilt as a nester is an exceedingly wary bird.

"PEP, PEP, PEP, TO TASTE"

"NEST THREATENED, THE PARENT BIRDS SHRIEK"

Rarely does a sitting bird permit approach within two hundred feet, and the photograph here shown was obtained from a blind. The poor Stilt has implacable enemies of three sorts at nesting time. If she consents to lay her eggs on dry land, or at least upon land not properly surrounded and cut off by water, the coyotes get them. Other forms of vermin are less timid about wetting their feet. Raccoons make systematic search of the marshes for anything edible, and especially for anything oological. Latterly, the greatest sheer destruction has been occasioned by hogs gone wild. These deliberate depredators constitute one type of enemy. Another is furnished by the careless tread of bovine hoofs. Not once, but many times, have I seen anguished Stilts standing guard over their nests and waving their wings frantically in an effort to ward off a group of passing cattle. Sometimes they succeed, for the stolid beef creatures seem vaguely aware that they are not wanted at that point; but another frenzied female had a more difficult task. She was trying to dissuade an inquisitive calf, who had more than half a mind to see what the row was all about anyway. Bird and beast stood nose to nose, and the herd became mildly interested, insomuch that two other birds had to trail feverishly back and forth in front of the nearest steer to prevent a move of reinforcement. The bird-man

interposed at this point on the bird's behalf, and expected at least the courtesy of a sitting (not a setting, mind you); but no—seventy-five yards was the nearest compromise those birds would make with their erst-while benefactor. Ergo, their portraits do *not* adorn this page.

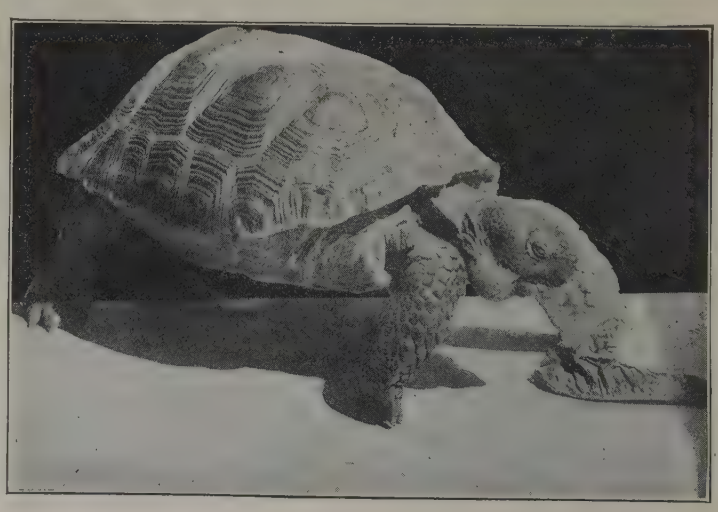
The last and greatest enemy is the rising flood water. This, for the most part, the birds have learned to cope with. No doubt tens of thousands of nests were destroyed by drowning before the birds hit upon an adequate plan for salvaging their homes. Whereas the flimsiest support or none, suffices to hold the Stilt eggs on dry ground, when flood threatens, the birds work in copious material—grass-roots, weed-stems, dry leaves, and even green herbage—into the foundation of the nest, and so rear the structure above the advancing water. In times of greatest stress I have seen nests reared nine inches above the ground, bearing their eggs high and dry above six inches of water which saturated the foundations. This evidence of resourcefulness on the part of the Stilt, I hold to be one of the cleverest things in nature. The Avocet has the same instinct, or acquirement—call it a gift, if you like—but a Killdeer nesting in the same pasture is utterly overwhelmed. So fixed is this habit, however, in the Stilt, that a mother bird, leaving her nest, for whatever purpose, will, if not frightened by a strange presence, take time to snatch a few beakfuls of loose wastage from the ground, and throw it backward over her shoulder and toward the nest.

"BABY BRIGHTNESS"

Just think what that means! Tennyson was right about his flower in the crannied wall. If we could understand what it is, *all in all* we should know God and man. In like manner, if we knew just exactly *how* the Black-necked Stilt came to hit upon this admirable scheme of home-saving, and how this acquisition became instinctive, we should be able to settle the discussion between Weismann and Lamarck, and we should probably know more than has been dreamed of by evolutionary philosophy to date. The writer has his little ideas upon this subject. Perhaps he will air them some time. In the meantime, and all the time, let biologists go to the Stilt, consider her ways and get wise.

A Patriarchal Tortoise

IN 1889, a tortoise, brought from the Mojave desert, was presented to the Los Angeles Chamber of Commerce. This tortoise was given the name of "Jumbo," and soon became a great pet. He is a great eater, and, although he has a large growth over his beak as a result of great age, he finds no difficulty in eating whatever is placed before him. He very much prefers lettuce, grapes, and peaches. The picture shows him eating a leaf of lettuce. As he was brought up in desert where he was used to a minimum of moisture, he seldom drinks water. By those versed in such matters he is said to be over 100 years old, the peculiar and extensive growth over his back rendering this guess quite plausible. He makes daily trips across the exhibit hall, eating from the hands of one of the gentlemen and following across the hall for more. From November to March he hibernates and revives when spring comes on, without losing any flesh.



The Carolina Gray Squirrel

By VERNON BAILEY

OF THE great order of gnawing animals, or rodents, the squirrels are probably best known, and of our eastern squirrels the grays are familiar to all of us. They are common even in the large cities, where they generally do, and always should, abound in the parks and private grounds.

While the rodents are not rated as very high in the scale of mammalian life, the squirrels are probably the highest, or most intelligent, of their order, with relatively large and well-developed brains. Measuring brains with beans, the skull of a one-and-a-half-pound squirrel holds twenty-five beans, the same as the skull of a ten-pound, or, if not fat, a five-pound opossum. Reduced to a ratio, the skull capacity is about seventeen beans to a pound of squirrel as against five beans to a pound of opossum, fifteen beans to a pound of raccoon, and thirty-six beans to a pound of well-developed North American Indian. But the bulk of brains is not the only test of intelligence, and this comparison should not be taken too seriously. The squirrels, however, show a very creditable degree of such knowledge as is most useful in their way of living.

Perfect adaptation to their mode of life is shown in every point of the squirrel's anatomy. The strong, narrow and sharp-pointed incisor teeth for cutting open the hardest shelled nuts are in striking contrast to the broad cutting chisels of the beaver, porcupine, and woodchuck, who cut the softer woods, bark, and green plants. The heavy muscles of the hind legs and back give speed and power for climbing tall trees and making long leaps through the air. The hands are skillful in catching and clinging to branches and in holding nuts while they are cut open and the meats eaten from between the little, short thumbs. The plumy tails are used in steering the long leaps through the air, in guiding to safety an accidental fall or forced leap from a tree top to the ground, for balancing on slender branches and making quick turns, and even for covering the squirrels at night while they sleep. The eyes are large, and quick to catch the motion of an enemy, but adjusted to the daylight only, for squirrels rarely come out of their nests at night.

CARRYING BABY SQUIRREL

The little one coils around its mother's neck, tail making a fur collar.

In winter their soft, light gray fur grows long and dense and keeps them warm in the coldest weather, as they run over the snow or dig up buried nuts from under it, but with the warm days of spring the fur becomes worn and ragged, and soon the hairs drop out to make way for thin, cool summer suits of inconspicuous brownish-gray.

The squirrels make their homes preferably high up, in hollow trunks of large old trees, where soft, warm nests are built for winter use. In

warm weather, when these old nests have become infested with fleas, summer houses of sticks and leaves are built in the leafy branches of the trees. From below, these often resemble the nests of crows and hawks, but they differ in being roofed over the top and having one or two doorways at the sides and soft nests in the central cavities. Where no hollow trees are to be found, these branch nests are often made large and warm enough to be occupied all winter. With the first cold weather the squirrels begin to gather warm bedding, soft bark fibers, fine dry grass, moss and leaves, and as the weather grows colder more bed covers are added.

If it has been a good nut year and the squirrels are well fed and vigorous, the early mating season in Washington, for example, begins in January. At this time several males, sometimes a dozen, may be seen following a female through the tree tops, but only the strongest, most virile of them all, that can strike terror into the hearts of all the rest, is accepted by the female as a worthy father of her family. There are many fierce fights among the males at this season, and those unable to win supremacy must keep back or retire from the field. Mating over, the male leaves the mother squirrel, who remains quietly at home and prepares the warm nest in a safe place for her prospective young.

OLD WHITE TIP

The tip of the tail, lost by accident, was replaced by a tuft of white.

In about six weeks, late in February or early in March, the baby squirrels are born, generally four of them, little, naked, pink, blind, helpless, and round-headed babies that must be kept warm and fed by the mother for a long time before their eyes open. In one case when twenty-three days old their eyes were not yet open. When about four weeks old the young begin to peep out of their house doors and a week later come out on the doorstep. Not until about six weeks old, when they are well grown, furry little squirrels with big plumy tails, do they begin to climb about in the branches of the tree and a few days later venture to the ground. Even then they sometimes get bad tumbles before they have learned to respect the force of gravity.

Before the young are old enough to leave the nest, or sometimes when they have begun to come out and climb about in the branches, the mother often moves the whole family to some better or safer place. She seeks a fresh nest where the fleas are less troublesome, a better food supply for herself and the young, or, best of all, a place where someone who loves squirrels has offered her peanuts and rolled oats and plenty of good, clean water on a squirrel table under a tree with squirrel boxes among its branches.

Every year for more than a dozen years some old mother squirrel has either had her young in one of the nest boxes in the hickory tree in our Washington back yard, or has brought them to us, sometimes from the big hollow oaks two blocks away. We have been greatly interested in watching her bringing one at a time, and often resting between trips until the whole family safely was transferred. Some times we have seen her carry them from the house in the hickory tree to one in the locust tree in the next yard, or back again, and once she carried them from the squirrel house in the tree to the one on the upper piazza, where she had to jump a distance of four or five feet from the branch to the screen-covered piazza post.

The method of carrying the young is most remarkable. The mother grasps the little one by a hind leg or a shoulder, close up to its body, and as she lifts him he coils around her neck, making a close-fitting fur collar with which she can travel freely, climb trees, or even make long leaps through the air. The young one seems to understand and does its part perfectly, keeping quiet until securely grasped, then curling up and holding on until placed

where it belongs, and after this remaining quietly in the nest until the others are brought.

The mother shows great watchfulness and anxiety for the safety of the young, and well she may, for stray cats are always watching for them and by stealthy methods occasionally get them. Dogs are more conspicuous and more easily avoided. When a cat or dog appears the mother squirrel barks in a scolding tone that sends the young scurrying to the higher branches or their nest boxes, where they watch until the danger has passed and the barking ceases.

FRIEND GRAY SQUIRREL

He forms a link of understanding between the human and animal worlds.

Once we saw a young squirrel in his first attempts to climb about in the tree lose his hold and fall twenty feet to the ground, where he lay stunned and helpless. The mother rushed down the tree, nosed him over anxiously until he began to move about, then took a good hold of his leg and carried him, clinging about her neck, back up the tree to the nest box and placed him inside. Another time when a neighbor's terrier caught and killed one of her young she was frantic when she heard its screams of pain and for long afterwards sat in her tree, calling and crying in most pathetic tones.

When about two months old the young are weaned, for by that time they can get their own food from the flowering tassels of the hickory and oak and from buds and leaves of various trees and bushes, or in some friendly yards can help themselves to rolled oats and peanuts; but for a month longer they are more or less under the watchful eyes of their mother.

About the time the first family is weaned, late in May or early in June, if food is abundant and the squirrels are in good condition there is a second mating, and a second family of young is born about six weeks later, or some time in July. These young do not appear out of the nest until about the first of September, and sometimes later, but are in time to share in the autumn feast of nuts and to help bury their share for winter food. Generally the mother remains with them well into or through the winter, or until the next year's mating season scatters them far and wide, the males to find mates, the females to select homes for prospective families.

The food of wild woods squirrels consists largely of nuts and acorns, which in a bounteous year lasts until the next crop is ready, but in times of scarcity of such food, buds and the bark from twigs serve as a winter supplement. The early flowers of maple and elm, and later in spring the tassels of hickory and oak will carry the squirrels until the elm seeds are ripe and these until the maple and box-elder seeds are large enough for food. There are so many kinds of maples that their seeds usually last well into summer or at least until the basswood nutlets are ready the last of June and these until the beechnuts and some of the acorns are old enough to furnish food. Then the nut harvest begins again. Many other seeds and plants and some mushrooms help out when other food is scarce, but in a good nut year the squirrels eat little but nuts. They busily gather and hide them away in little holes in the ground, where if forgotten or not needed some are left to grow and spread the forest, insuring a supply of nut and acorn trees for squirrels of future generations. What must they think of us for cutting down their trees and letting the fire burn up their beautiful woods?

Squirrels are thirsty little people and cannot stay long where there is no water. They appreciate a clean cool drink on a warm day as much as we do. Winter or summer they must have water every day.

At times they are greatly tormented by the fleas that live in the old nest boxes, but if their houses are cleaned out once or twice a year, and a good spoonful of flea powder (pyrethrum) occasionally thrown in, the fleas will be killed and the squirrels will stop scratching. A spoonful of powdered sulphur will also help to keep out the mites and such troublesome pests that often annoy them and make their fur look rough and ragged.

Too many squirrels always do mischief, for when they have eaten the available food supply they must find new foods and in such cases may eat the farmer's corn, injure his trees, and even rob birds'

nests, but well-fed squirrels rarely give cause for any complaint.

The newness of the "New World" is well shown in the fact that practically all our domestic animals have been brought from the "Old World." The turkey is perhaps the most valuable exception, but others will come later and several, including the squirrels, are coming slowly into partial or complete attachment to man and his industries or pleasures.

The squirrels have long served useful purposes as game and food for the hardy advance guard of civilization in America and have helped to train our pioneers and patriots in the marksmanship that has won our wars. Now they are serving another useful purpose in our lives by their friendly acceptance of our hospitality and the confidence they return for our advance of friendship. To feel the light grasp of a skillful little paw on your finger as one eagerly takes a peanut from your hand gives a thrill of pleasure that one who loves animals can well appreciate.

To the thousands of city children, with no animal friends to love and pet, the park squirrels afford a golden link of sympathy and understanding between the human and animal worlds. Even to the grown-ups, the influence of a free, wild native animal in our midst, protected, fed and guarded through interest rather than by force of law, has a value far beyond mere commercial standards.

A Nature Passion Play

By Edward H. Parry

FOUR years ago the message of bird protection was carried to the students of the Charles W. Henry Public School in Germantown, Philadelphia. The 700 boys and girls studied their winged brothers of the air. A near-by wood was made a Bird Sanctuary. A building at its edge was saved from demolition and turned into a museum. A Bird Club was organized. But behind all these things—out of it—is the annual Bird Masque.

The Masque is given in the Sanctuary in May on a level strip at the foot of wooded slopes. Branches arch overhead, woods serve for wings and background, and the stage is outlined by a meandering brook. The audience, larger year by year, crowds the hills and open valley, while more than 200 pupils take part in the performance. It is a festival of color. The showiest native birds are represented in costume. Their scarlet, blue, yellow and other colors mingle spectacularly with the khaki of hunters, white of children and the vivid apparel of foreign peasantry. It is a gay spectacle, sumptuous, dazzling, yet artistic every moment.

The story of the Bird Masque is effective in its simplicity. A little girl enters the sunny clearing. She gathers flowers and dances by the brook until, becoming tired, she lies down and falls asleep. What she dreams concerning the ideal relationship of birds and mankind is portrayed by May Day dances of children and birds. To sprightly polkas, marches and folk-songs, the human and feathered beings dance and sing together. Gaiety and happiness are unbounded. Suddenly, however, scores of hunters rush in, shooting in all directions and filling the glade with fear and distress. The birds flee in panic—all but the cardinal. The gorgeous red bird has been wounded; its death is the climax of the performance. The pathetic wavering, the courageous effort not to fall, and the final crumpling up of the little body are tremendously effective. As the last notes of Saint Saens' "Le Cygne" die away, the fluttering ceases, and the beautiful creature lies dead.

Depression is marked, but spontaneous enthusiasm ensues when the hunters throw down their guns and join in a universal resolution to protect the birds.

And the result of it all? A school tradition. Pride in the Bird Masque. A feeling akin to that of ownership in the Sanctuary; and incidentally, an aroused youth is the police par excellence for such a place. Furthermore, the Masque is a family tradition. Young sister and young brother practice at home against the time when they may step into their elders' shoes. The portrayer of the cardinal last year was a younger sister of the creator of the rôle, and her amazing acting was the result of years of imitation and practice. Parental pride is aroused, community spirit is touched, and thus the entire neighborhood is infused with active interest in birds and their protection.

Germantown residents feel that it was genius on the part of Miss Caroline T. Moffett, the principal, that linked them to a recurring festival in the Henry School. Few things are more real or lasting than school pride and school tradition. Clubs languish. Writings and random performances, however excellent, lack the "follow-up" system enduring success demands. The supporters of private sanctuaries pass away. But *schools* go on forever.

The Great Rainey Bird Sanctuary

By T. GILBERT PEARSON, LL. D.

President, National Association of Audubon Societies

THE SOUTHERN boundary of Louisiana is fringed by marshes, vast in extent, green in summer, brown in winter. From the delta of the Mississippi River they extend westward far into Cameron Parish, where they rise gradually to meet the prairie country of Texas beyond the Sabine River. For two hundred and fifty miles they lie almost unbroken along the coast except for occasional bays and wandering lagoons. Inland they run fifty miles or more from the shallow shore waters of the gulf until they are destroyed by the drainage ditches of the crop lands.

Through all their length and width flow winding bayous that sluggishly bring the swamp waters from the upland or, when the lazy tide turns slowly, carry upward the salty waters of the sea. Here and there man-made canals facilitate the passage of those hunters, trappers, and cattle men who, in their seasons, have occasion to journey through the marshes.

In these vast solitudes of grass and rushes the wild creatures exist much as they have from the days when white man first threaded their waterways. About the parched margins of the pools in summer the killdeers' cry and the black-necked stilts build their odd nests. Along the ditch banks the kingbirds and redwings rear their young. Clapper rails shout to each other in the marshes, and now and then a dusky duck or blue-winged teal is seen. Undisturbed by man, the summer life in the marsh goes on. But when winter comes a great change takes place in southern Louisiana. Many summer birds depart, and from the far north hordes of water fowl sweep down upon the marshes. Ducks in such numbers that no man can count descend into the areas of fresh water now common everywhere. At times they arise in great flocks and go inland to the rice fields or change from one local feeding ground to another. At daybreak one hears them quacking among the rushes, and at night the swish of passing wings is a familiar sound.

THE BLACK-NECKED STILTS NEST HERE

Undisturbed by man the summer life in the marsh goes on.

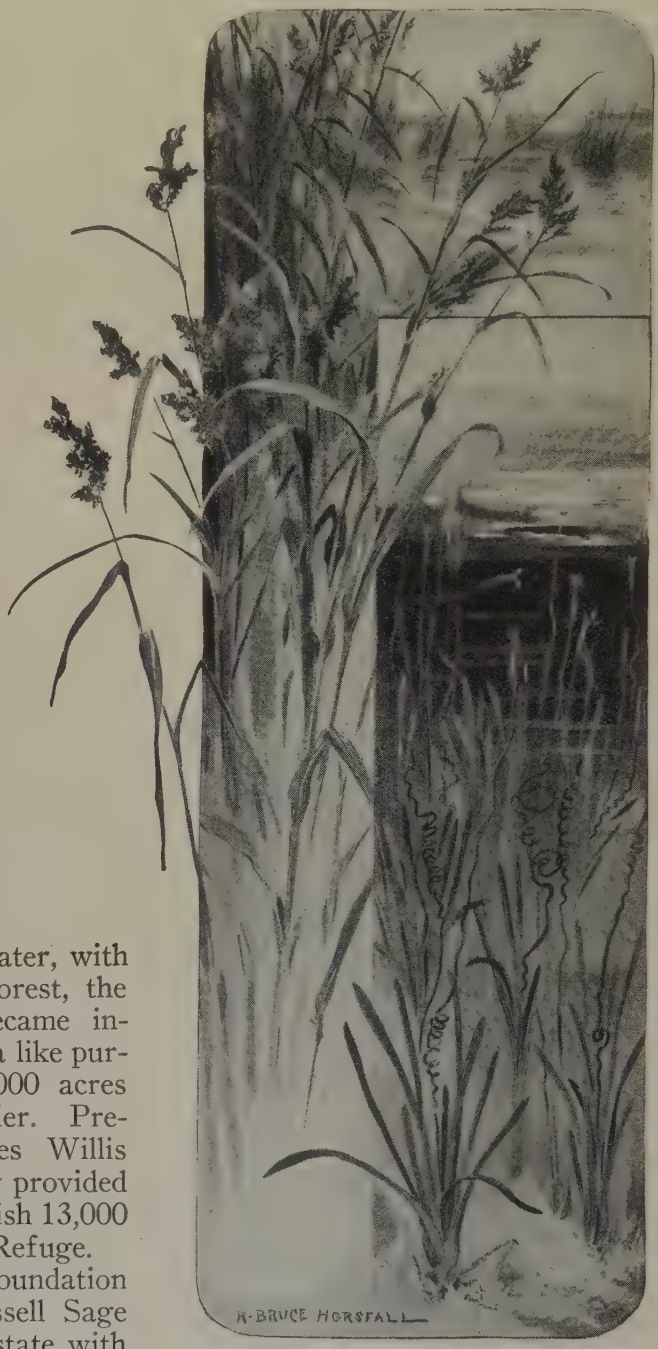
Here also is the winter abode of the blue goose, whose summer home is far within the Arctic regions. At times these handsome winged *voyageurs* collect in flocks of 100,000 or more, and

when such an assemblage takes flight the sight is one of the seven wonders of the bird world.

Water fowl collected in such numbers and over such a wide territory naturally at an early date drew the attention of many gunners. Until the passage of the Federal Migratory Bird Law in March, 1913, therefore, this was a great killing ground for man who engaged in hunting for market. Since then it has attracted chiefly those who go afield for recreational sport or for food for themselves and friends.

However, this country is a great distance from the larger centers of population, and it is not strange that for a long time little was known of its vast wealth of wild fowl. In fact it was not until 1912 that the attention of the general public was sharply drawn to the region. In that year, Edward A. McIlhenny, a local land baron and a hunter of extended experience, interested Mrs. Russell Sage in purchasing as a Wild Life Refuge the tract known as Marsh Island, a territory of about 79,000 acres. Two years later, with the aid of Henry W. deForest, the Rockefeller Foundation became interested and purchased for a like purpose another tract of 86,000 acres known as the Grand Chenier. Previous to this time Charles Willis Ward and E. A. McIlhenny provided funds to purchase and establish 13,000 acres as a State Wild Life Refuge.

Later the Rockefeller Foundation and the heirs of Mrs. Russell Sage gave their holdings to the state with the understanding that they would be preserved for the purpose which they had been originally purchased.



FOOD OF THE MARSH

Wild millet on the left and wild celery on the right.

Lying next to the State Wild Life Refuge and joining it on the west is a region that has long been one of the chief concentration places of wild fowl in this astonishing country. It has, therefore, been highly prized as a hunting ground. It came into the possession of Mr. McIlhenny and Paul J. Rainey, world-renowned hunter, explorer and photographer, and by them held under the name of the Vermilion Bay Company. A clubhouse was built, and here for some years many visiting sportsmen from far and near were entertained.

The writer has been on many famous hunting grounds in this and other countries, but never within a given time has the sight of so many ducks met his gaze as he saw here one day some years ago.

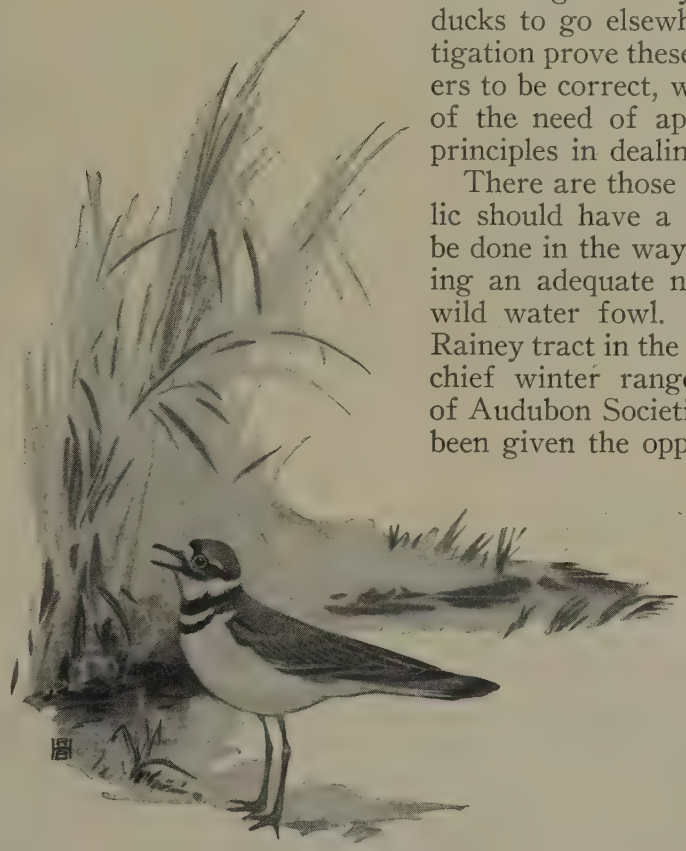
In 1923 Mr. Rainey died on shipboard while bound for Africa on another hunting and photographing expedition. His sister, Mrs. Grace Rainey Rogers, inherited his property, and to her the writer went with the suggestion that she retain her interest in the Vermilion Bay Company, buy out the interest of the other stockholder, and make of the territory a Wild Life Sanctuary in memory of her brother. She is a woman of vision and broad sympathies and, after due deliberation, decided that she would like to do this. It was soon found, however, that the other stockholder was more desirous in buying her interest to add to his shooting grounds than he was in selling his own. In the end the property was divided, Mrs. Rogers retaining the clubhouse and two-thirds of the land—something more than 23,000 acres.

This she offered to deed to the National Association of Audubon Societies, and the Association in turn gladly agreed to develop and maintain the same as the Paul J. Rainey Wild Life Sanctuary. On June 18, 1924, such a contract was signed.

In addition to dedicating this wonderful tract in perpetuity to the cause of wild life protection, Mrs. Rogers provided funds so that the Association need not at any time be cramped in carrying

out the developments and providing the guardianship which it has undertaken to furnish.

The preservation of the highly migratory ducks and geese of North America presents today an old problem in a new phase. Fifteen years ago the great question was how to keep pot hunters from exterminating them. The problem now looming on our horizon is how are we going to keep them supplied with adequate feeding and nesting areas. This group of birds, of course, inhabit shallow lakes, ponds and marshes, and until comparatively recent times such places existed abundantly in our country. Drainage for agricultural purposes, however, has been going forward at a tremendous rate. Already over 71,000,000 acres of marsh and swamp lands have been dried up. This represents a territory as large as the Great Lakes or twice the size of the New England States. The feeding grounds of the ducks consequently have been much reduced, and the birds of necessity are forced to concentrate on less extensive food areas. Competent observers throughout the United States are largely unanimous in their reports that, as a result of stopping spring shooting and the closing of the market by law, wild ducks are now growing more numerous with each passing year.



THE KILLDEER CRY

They are found about the parched margins of pools in summer.

Note the situation that confronts us — feeding grounds annually becoming scarcer and ducks increasing in numbers. It is not today enough simply to declare a territory a Game Refuge, keep off shooters, and expect the ducks to live there happily ever after. Hon. Alva Clapp, of Kansas, at a recent conference in Washington, D. C., reported large numbers of ducks coming north in spring through his territory in a weak and emaciated condition. Apparently they had eaten out the food in their southern winter abode.

When Mrs. Sage gave Marsh Island to the state of Louisiana as a duck preserve, provision was made in the deed of gift that the Audubon Association was at all times to exercise a certain oversight.

Mr. John P. Holman, representing the Association, visited Marsh Island the past season to examine conditions and found that, instead of the vast swarms of ducks supposed to be there throughout the winter months, only small flocks here and there were seen. Inquiry brought forth statements that increasing scarcity of food had forced the ducks to go elsewhere. Should careful investigation prove these conclusions of local observers to be correct, we have but another example of the need of applying game administrative principles in dealing with wild fowl.

There are those of us who feel that the public should have a demonstration of what can be done in the way of supplying and maintaining an adequate natural food supply for our wild water fowl. By the gift of this great Rainey tract in the very heart of the wild fowls' chief winter range the National Association of Audubon Societies suddenly and happily has been given the opportunity it has so earnestly desired.

On July 4, 1924, Mr. Holman entered the territory to take possession of the clubhouse and begin the Association's activities in the new reserve. With him went a U. S. Government warden and the superintendent of one of the largest firms in the country that supplies and plants duck foods. Laborers also were brought this first day, and the planting of vegetation which produces food loved by wild ducks was at once begun.

Perhaps some reader may wonder just what sort of things one would plant in a marsh with the expectation of making of it a happy habitat for ducks.

Well, here is what was planted in the Rainey Wild Life Sanctuary the past summer: Wild Duck Millet and Smartweed seed to the extent of 452 pounds; 38 bushels of Widgeon Grass, Water Milfoil and Floating and Submerged Duck's Meat; 500 Wild Celery winter-buds; 1,000 pounds of Wampee Plants; 2,945 pounds of Wapato Duck Potato Tubers; and, finally, Sago Pond Plant Tubers to the amount of three tons and two hundredweight.

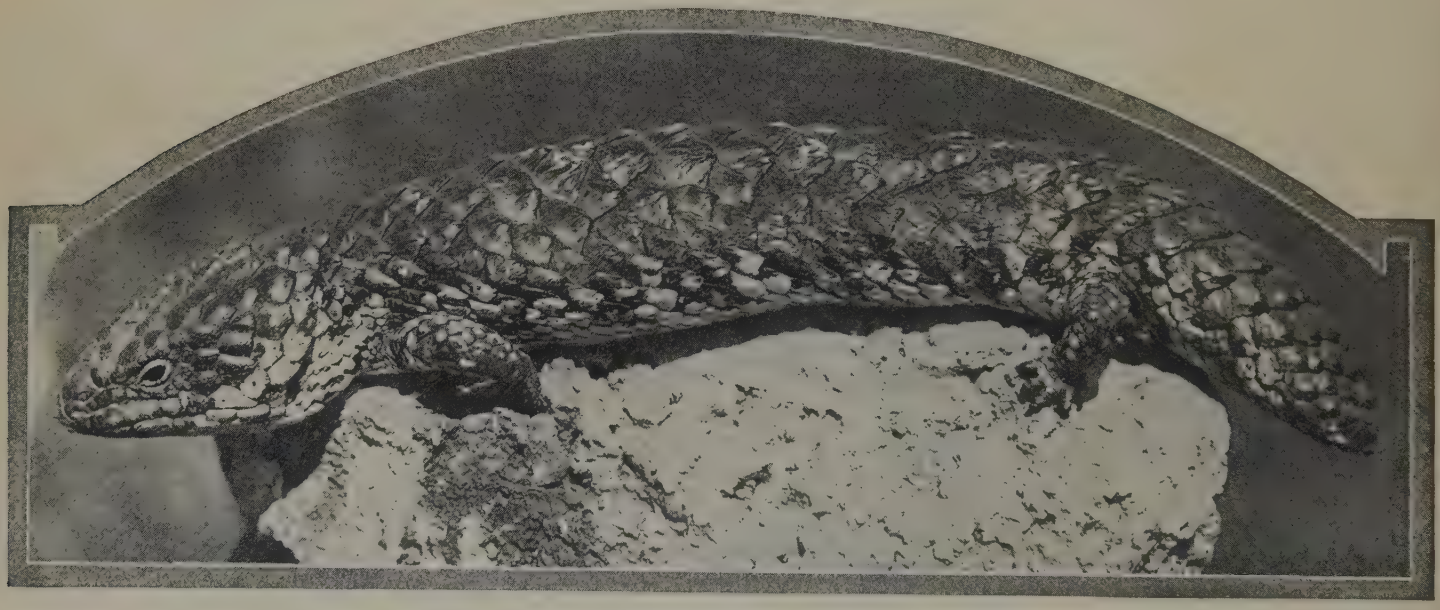
These names may not mean much to some people. The untechnical observer seeing specimens of such vegetation might variously classify them as "weeds," "grass" or "pond moss," but to the hungry wild duck they mean food, and splendid food at that.

The areas planted will be kept under careful observation, the extent of growth noted, local con-

ditions best suited for different duck foods will be determined, and other species of vegetation will be introduced. It is planned that year by year the planting will go forward, and every effort will be made to make of this area an ideal winter home for such millions of ducks as can find refuge within its boundaries.

PLANTING THE BIRD FOOD
Feeding grounds are annually becoming scarcer.

The guarding of the Paul J. Rainey Sanctuary has been placed under the direct supervision of the United States Bureau of Biological Survey, and three government game wardens are now on the territory. Large trespass signs have been erected, and lookout towers have been built. Cooperating with the Audubon Association, the Government will conduct numerous studies regarding the best conditions surrounding the well-being of the wild fowl from every angle. Besides a real bird sanctuary, this also will be a huge laboratory for tests—a duck experimental farm on a scale hitherto unknown.



The Australian Stump-tailed Lizard

By KILROY HARRIS

AMONG the rocks of Eyre's Peninsula in Australia are to be found many Stump-tailed Lizards, sluggish reptiles, which are easily captured. "The Stump-Tail"—as it is known in "The Bush"—is about a foot long, or even eighteen inches; it has a thick body, with a short flattened tail. Its stumpy limbs indicate that this lizard was not designed by nature for activity; it spends most of its time asleep on the rocks, but it is a brave little creature and faces a foe with open mouth. Like other members of the lizard family in Australia, the "stump-tail" frequently attacks and kills snakes. It is not, perhaps, such a hero as Kipling's Rikki-tikki-tavi, the Mongoose, but once its jaws close on the flesh of a serpent, it clings with bulldog tenacity till one or other of the combatants dies. The native Aboriginal "blackfellows" consider the "stump-tail" lizard a luxury cooked over the embers.

Insects and Forest Trees

By T. E. SNYDER

Bureau of Entomology, United States Department of Agriculture

INSECTS annually kill an enormous number of healthy living trees and this class of enemies of the forest is an important factor in the destruction and waste of our forest resources which must be considered in our efforts for conservation. Were it not for the natural checks and natural factors of control of the more destructive insects, which tend to maintain a balance, depredations would be far more continuous and complete and indeed we might have no forests. As it is losses of living trees amounting to $100,000,000 annually are caused by insects. Hence it will readily be seen that protection of forests from insects is of scarcely less importance than their protection from fire.

No. 1—WESTERN PINE BEETLE
(Greatly enlarged)

These little beetles bore through the bark and kill the largest and most merchantable timber.

Bark beetles are the most destructive insect enemies of the coniferous or softwood forests of North America. Living, healthy trees are attacked by swarms of the small, dark and cylindrical adult Dendroctonus bark beetles (Figure 1), which bore through the bark on the main trunk and excavate their egg galleries in the cambium or inner living tissue between the bark and the wood. This weakens the tree and the larvae hatching from the eggs excavate burrows between the parent egg galleries, completely girdling the trees (Figure 2), causing their death (Figure 3). These bark beetles concentrate on and kill the largest and most merchantable timber. By harvesting the mature and over-mature trees and protecting the second growth by keeping the bark beetles under control, the serious epidemics which have periodically been so destructive to our forests, particularly in the Rocky Mountain and Pacific coast regions and in the northeastern and southeastern states, will be prevented.

By the proper use of control methods advocated by the Bureau of Entomology these insects can be controlled and their damage reduced to a minimum at very little expense. The trees must be felled and the bark peeled from the main trunks. In case of the mountain pine and Black Hills beetles, which breed next to the wood, it is not necessary to burn the bark (Figure 4); but in case of the western pine beetle and southern pine beetle, which develop in the outer back, it is necessary to burn the bark after peeling (Figure 5). Where the timber is small (under thirty inches D. B. H.) and the bark can be spread in full sunlight at an air temperature

No. 2—GALLERIES OF THE WESTERN PINE BEETLE

The beetles lay eggs in these galleries in the inner living tissue between the bark and the wood of trees and kill the trees by girdling them.

No. 3—LODGE POLE PINE KILLED BY BARK BEETLE

These gaunt dead trees are mute witnesses of the tremendous destruction which is being wrought by the activities of this dangerous forest insect.

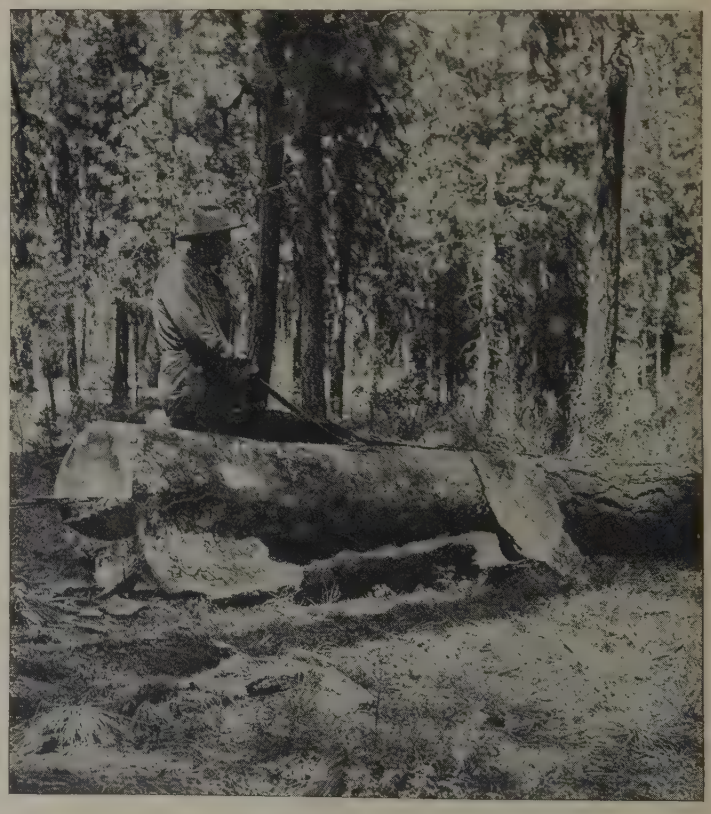
of 85 degree Fahrenheit the bark will reach a temperature of 110-115 degrees, which will kill the larvae, pupae and adults. This solar heat method of control can be used to supplement the burning method, especially during the season when burning is dangerous due to the forest fire menace.

At present in southern Oregon and northern California the Federal Government and private timber owners, under the direction of the Bureau of Entomology, Branch of Forest Insects, are cooperating to control an epidemic of the western pine beetle (Dendroctonus brevicomis Lec.). This epidemic extends over an area a little larger than the State of Delaware, in which area, in the last ten years, the beetle has killed merchantable yellow pine timber valued at over $3,600,000.

During 1922, 200 square miles of the project area was cleaned up; 11,449 infested trees containing 12,187,790 board feet were felled and the bark containing the broods of destructive beetles burned. This required a labor force of approximately 200 men working for two months during the spring and two months again in the fall, and cost $55,-246.19. The surveys conducted by the bureau in the late fall showed that the work had been very successful and had reduced the infestation seventy-two per cent in the areas worked, so that in one year enough timber had been saved to pay the costs of the work, and future reduction will be net profit.

More than a century ago (1807) the spruce of Harpswell and Orr's Islands, on the New England coast, was killed by a worm and the dead timber utilized to convert sea water into salt; and about eighty years later the spruce budworm (Cacoecia (Harmologa) fumiferana Clem.) (Figure 6) killed the second growth timber on these unfortunate islands.

From 1878 to 1885 an invasion of this insect swept over the New England and New Brunswick woods and, aided by bark beetles and disease, caused the death of a large percentage of the old spruce and fir. Then for about thirty years there was little or no evidence of its presence. Another outbreak developed in 1910 which continued its depredations in different areas throughout the north woods until 1921. Experts who have made a special study of the insect and its depredations in Maine and Canada state that from twenty-five to seventy-five per cent of the merchantable or older fir, and a somewhat less percentage of the spruce, have been killed in Maine, New Brunswick and Quebec. Like the epidemic of about thirty years ago, the greatest



No. 4—A METHOD OF CONTROL

By peeling the infected bark from pine trees and then by burning the spread of the bark beetle may be stopped.

abundance of the insects and defoliation of the timber on any given area occurred during the first two or three years, after which the trees began to die, and continued dying for five or six or more years.

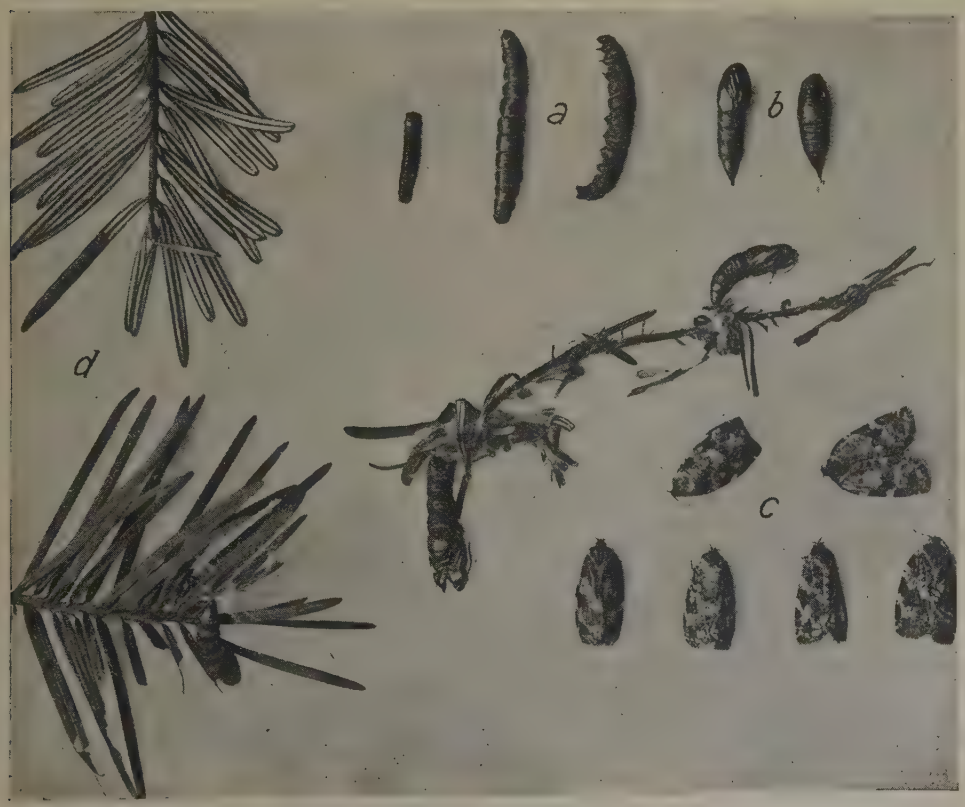
This same insect which has devastated the spruce and balsam fir forests of the northeast is also present in the western states and has defoliated extensive forested areas of Douglas fir and Engelmann spruce in northern and central Idaho and in the Yellowstone National Park in Wyoming. Vigilant watch must be kept over the progress of this insect in our magnificent western forests. Future epidemics may be prevented by forest management and the development of types of stands of trees least favorable to the insect and least susceptible to injury. Checking of present invasions is a difficult problem which remains as yet to be solved with entire satisfaction.

Previous to about 1850 there was a great amount of matured larch or tamarack from west of the Great Lakes to the Atlantic coast, but it was practically all killed by successive outbreaks of the larch worm (Nematus erichsoni Hartig).

A summary of the evidence relating to the depredations by this insect indicates that there have been about five more or less extensive outbreaks beginning in about 1853 and ending about 1907: from 1881 to 1886, a great invasion extending from Maine into New York and over the whole of eastern Canada, from Labrador to about thirty miles west of Ottawa; from 1889 to 1891 and 1894 to 1898, outbreaks occurred locally from Prince Edward Island to New York and Guelph, Ontario; and from 1903 to 1907 a great invasion extending from eastern Canada westward to a point just north of the middle of Lake Superior, and locally through New England, westward to Wisconsin. The aggregate area covered by these outbreaks appears to be that represented by the natural distribution of the larch east of Wisconsin, or about 600,000 square miles, in which a very large percentage of the so-called matured larch was killed by the insects.

No. 5—KILLING THE BROODS OF THE BEETLES

During the spring period of control all infested trees were barked and the broods burned. South Oregon Control Project, located in Oregon.



No. 6—SPRUCE BUDWORM

This grouping shows the insect in various stages, as follows: (a) caterpillar; (b) chrysalis; (c) adult; (d) work of spruce budworm.

At present, this insect is not epidemic, although there is some evidence of an outbreak in the upper peninsula of Michigan, which apparently began in 1912.

The white pine weevil (Pissodes strobi Peck) (Figure seven) is one of the most destructive insects to the reproduction and plantations of pine and spruce—particularly in New England. The damage and loss consist not only in the death of the leaders or terminal shoots, but in the subsequent abnormal development of the trees so injured. The killing of the leader results

in new growth of the lateral shoots bending up to replace it, resulting in a forked and many-branched top. Each of these lateral branches produces a vigorous terminal and all compete for leadership in forming the crown. In succeeding years the more vigorous terminals of the topmost branches are attacked and killed, causing more branches and preventing the development of the normal straight trunk, necessary in trees which are to be possessed of commercial value.

Open, rapid-growing pure stands or plantations are more susceptible to injury; dense, slow-growing pure stands or mixed stands of pine, other conifers, or hardwoods, are least liable to attack. Closer planting will thus be unfavorable to weevil injury and even if the terminals are killed, the shade of these denser stands will enable the lateral branches to produce an upward growth and the dominant one soon repairs the damage.

In damaged stands, the infested terminals should be cut off during the first half of July before the weevils have emerged, and placed in barrels screened with wire fly netting over the ends, and left on their sides in the plantations. This will enable the parasites of the weevil to escape, while the weevils die.

The locust borer (Cyllene robiniae Forst.) attacks healthy living locust trees and in addition to causing wormhole defects in the wood, often kills the tree or renders the wood unfit for any use except fuel. The death of the tree is caused principally by injuries to the cambium, resulting from repeated attacks.

The adult beetle (Figure 8) is a striking black or brown and yellow striped long horn beetle, which is found in the autumn feeding on the flowers of the goldenrod. This winged insect deposits its eggs in crevices in the bark of trees from August to October. The larvae hatch and burrow into the outer layers of the inner living bark, where they pass the winter. They remain in a sort of hibernation state until spring, when they are ready to begin their devastation.

No. 7—ADULT OF THE WHITE PINE WEEVIL
(Enlarged)

This is one of the most destructive insects to the reproduction and plantations of pine and spruce, as it causes the development of abnormal growth.

No. 8—ADULT MALE BEETLE—LOCUST BORER
(Enlarged)

This insect attacks healthy locust trees and often kills the tree or renders it unfit for use in any manner excepting for fuel.

The first evidences of attack are fine brownish boring dust and wet spots on the bark, first observed in April when the overwintered larvae begin to enter the inner bark. As soon as the larvae enter the sapwood an additional evidence of their presence is yellowish boring dust mixed with liquids and gum-like exudations. These borings later lodge in quantity in the loose bark of the trunk and around the base of the tree. At this stage, about the middle of May, in badly infested trees, the foliage will fade and the trees will die as a natural result of the attack.

So extensive is the damage to natural growth and plantations, that it has been considered unprofitable to grow locust trees for shade, timber, or for the purpose of furnishing fence posts.

It has recently been discovered, however, that plantations of this tree can be protected successfully from the borer and grown profitably on a commercial scale if the locusts are planted in thick stands or mixed with other trees so as to produce a densely shaded condition and natural pruning during the first ten to fifteen years of growth.

These few instances of devastation will serve to illustrate the enormous amount of injury insects are capable of causing to our forests. Entomologists and foresters must be constantly on guard to prevent epidemics and to devise new methods for insect control.

Constantly the United States Forest Service, the entomological experts and the specialists of other forest conservation agencies are conducting quiet research to discover the habits and dangers of these insect enemies of the forest. Elimination of waste of our forest resources formed the central theme of a recent conference of wood-using interests held in Washington, and the insect loss is one phase of this work. While much of the waste to our forests can be laid at human doors and can be checked by human vigilance, the enmity and inroads of these smaller attackers of the forest demand unceasing scientific vigilance. The importance of study and constant application of information known and as yet unknown cannot be too strongly emphasized.

Mira, the Wonderful

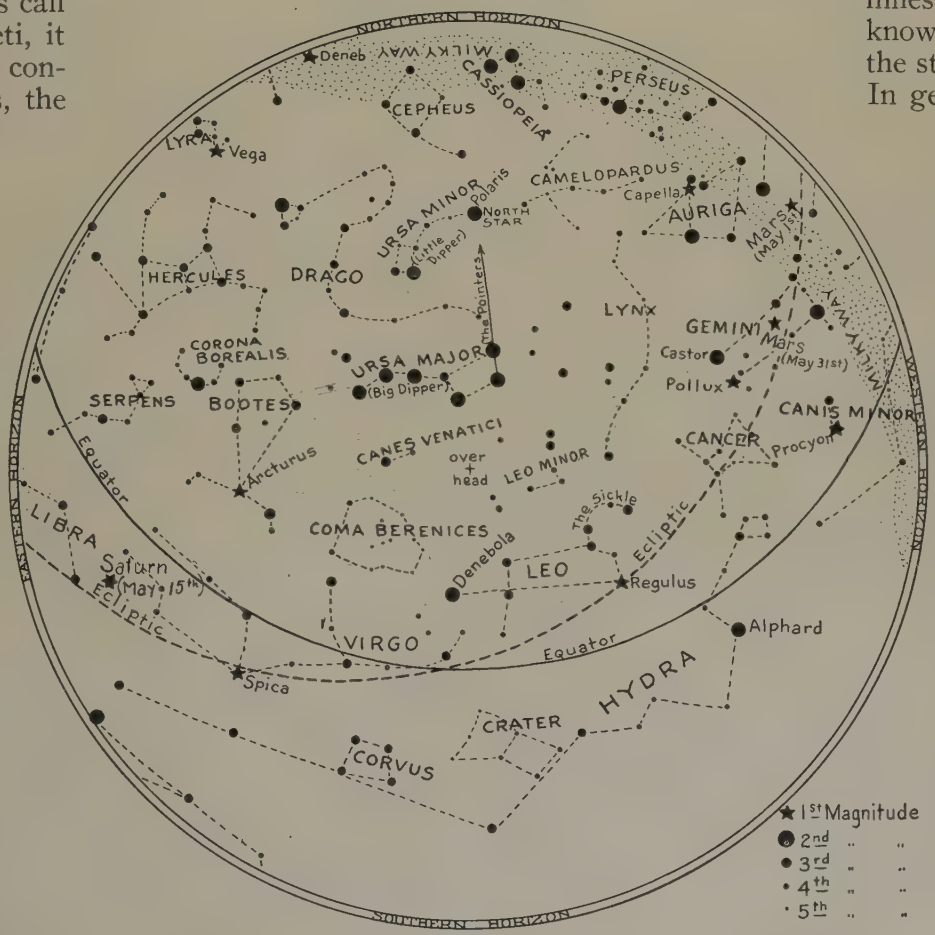
By ISABEL M. LEWIS

MIRA, the Wonderful, has gained the distinction of the front pages of the newspapers. Astronomical calipers have been taken to this star and it is found to have a diameter of 250,000,000 miles, outclassing the mighty Betelguese and standing second in girth only to the giant Antares with its diameter of 400,000,000 miles. Our puny earth with its 8,000-mile diameter would rattle around inside of Mira (pronounced Myra) like a pea in a giant hogshead.

The astronomers call Mira, Omicron Ceti, it appearing in the constellation of Cetus, the Whale, which is visible in the evening hours of the fall and winter. Betelguese, the red variable star of Orion, is variously estimated to boast a diameter ranging from 215,000,000 miles to 265,000,000. Antares, the fiery red star of the Scorpion, still is undisputed leader.

Measurements of the diameters of a number of stars have been made recently by Prof. F. G. Pease at the Mt. Wilson Observatory, California, by means of the interferometer attached to the 100-inch reflector, the largest telescope in the world. This device for measuring the diameters of the stars was invented by Prof. A. A. Michelson and was first used in measuring the diameter of Betelguese in 1920. Since then measurements have been made of a number of stars suspected of being exceptionally large—giant stars, as they are called. Among these are Arcturus, Aldebaran, Alpha Herculis and Mira.

The cycle of a year has been completed in this series of astronomy articles. Each month from now on the star maps will be printed, although they vary comparatively little from the maps of the corresponding months past, together with a brief description of the evening skies. In each issue, however, closer and more detailed consideration will be given to one or another of the wonderful things of the heavens. This month it is the giant star, Mira.



By means of the interferometer the angular diameters of the stars are obtained. To change these angular measurements into miles it is necessary to know the distance of the star from the earth. In general the distance of the star is in doubt by one-fifth of its amount or even more, and this introduces an error of equal size in the star's diameter. It is well to remember this, for otherwise one may be puzzled by the fact that the astronomer sometimes changes his estimate of the diameter of the star when he feels he has a better value of the star's distance from the earth.

Omicron Ceti earned its name of Mira, meaning Wonderful, over three centuries ago when in 1596 the astronomer Fabricius first noted that it underwent most peculiar and remarkable light changes.

These changes have been observed now through more than three hundred cycles of about eleven months each. During most of the eleven-month period the star is invisible without the aid of a telescope. Then a sudden rise to maximum brightness will take place within a period of a month or six weeks, when the star will be visible to the naked eye and will become for a week or ten days, or possibly even longer, a star of the second or third magnitude. Then there will be a rapid decline in brightness.

The star has now become invisible to the naked eye again and will gradually fall to the rank of a ninth magnitude star. On some occasions it becomes fainter than others, and again it may, at its maximum brightness, become exceptionally bright. It is recorded that Sir William Herschel saw it on one occasion as bright as Aldebaran. Additional interest in Mira was aroused about a year and a half ago when Prof. Robert G. Aitken, of the Lick Observatory, was asked to observe this star by Dr. Alfred A. Joy, of the Mt. Wilson Observatory, who suspected from observations of this star that he was making with the spectroscope that it possessed a companion star. Prof. Aitken, who is noted as a double star observer, was surprised upon then observing the star to find that it was attended by a faint, bluish companion star which was totally invisible a few years ago when Mira was observed at the Lick Observatory and elsewhere.

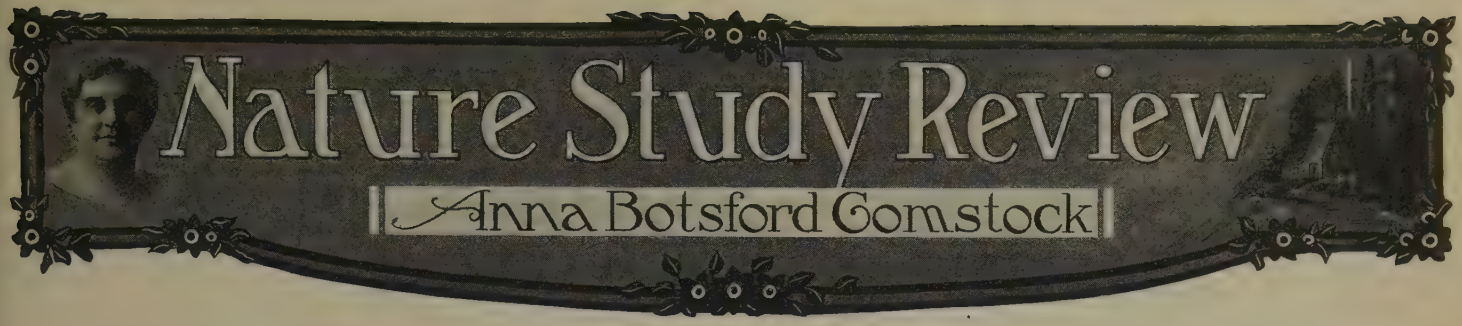
As the two stars are in revolution about each other it is impossible to see them as separate stars when one is in line or nearly in line with the other, at each revolution. At present they are separated by a distance of about four thousand million miles. The planet Neptune, we will recall, is at a distance of nearly three thousand million miles from the sun. What a wonderful spectacle these two suns, Mira and its companion, would be to one observing them from a nearby planet world! Mira is estimated to be at a distance of 165 light years from the earth; that is, the light of Mira takes 165 years to travel to the earth at the rate at which it travels of 186,000 miles in a second. We see Mira today, that is, as it was 165 years ago when the light we now see left this star.

Coming now to the star map for May, we notice that Leo is now over in the western sky. Denebola, which is in the tip of the Lion's tail, is almost exactly due south at this time, and Regulus and The Sickle in Leo are to the southwest of the zenith or point overhead. Virgo, another of the spring groups, lies just to the east of Leo. You can tell this constellation by the rather crooked "Y" that is outlined by some of its brightest stars with Spica, a beautiful white star at the bottom of the "Y." You will also find the beautiful planet Saturn in Virgo this month, at the eastern limit of Virgo, in fact, between Virgo and Libra. Just a word about Saturn in particular this month.

On May second Saturn comes into opposition with the sun; that is, it is directly opposite to the sun with our planet earth between the two bodies. So it will rise at sunset, be on the meridian due south at midnight, and will set at sunrise. So Saturn will be above the horizon all night on that date and nearer to the earth and brighter than at any other time during the year. As we thought you might be wondering just *how* near, we looked up the distance of Saturn from the earth for that day and find that it is 821,340,000 miles. Not very close, is it? But then Saturn is one of the more distant planets; only Uranus and Neptune are still more distant. Uranus you can pick up as a faint sixth magnitude star if you know just where to look, but you never can find Neptune without a telescope—it is so far away. Saturn, you know, is the planet with the rings, three of them in all, and if you live in a town where there is an observatory and a visitor's night for the general public, as there is at all the leading observatories in the country, try to find an opportunity to look at Saturn through the telescope while it is at its best, though you will find that Saturn will continue to be in fine position for observation in the evening all summer. Possibly you may know someone who possesses a small telescope. It does not take a large one to show the rings of Saturn. If so, ask him to show you the Ringed Planet. The rings are now inclined to the earth at a high angle, so they can be seen to excellent advantage.

Other constellations visible this month we will leave you to find for yourself with the aid of the sky map, such as the ruddy planet Mars, the Big Dipper, and the huge water-snake, Hydra, that fills most of the southern sky below the celestial equator, with his two riders, Corvus and Crater. Do not forget to look for Boötes and Arcturus in the east, the brilliant Vega in the northeast, and Capella, an old friend, in the northwest.

It is all about us, accepted as a matter of course. We could not live without it. We breathe it day and night. Air is the subject of an entertaining article by Charles Fitzhugh Talman in the June number.



Nature Curriculum in Court

PROF. J. A. HOLLINGER, Director of Nature Study in the Pittsburgh, Pa., public schools, declares that the Nature Study curriculum is "in court." It is being tried and found wanting, as might be expected from its comparative youth. The following is an abstract of an address by Professor Hollinger before the National Council Supervisors of Nature Study and Gardening, developing his view of the situation:

"The specific aims or ideals of Nature Study have been worked out by the American Nature Study Society. Along with this statement of objectives the Society has also agreed upon certain principles governing the selection of Nature Study material. A general agreement upon the statement of such aims and principles is exceedingly difficult. However, there can undoubtedly be general agreement that the aims of Nature Study should include at least these ideas: 'The simplicity to wonder, the ability to question, the power to generalize, and the capacity to apply.'

"If there could be general agreement upon these ideals, the next step in the development in the Science Curriculum is to analyze these ideals into working units and to select those activities that will lead towards the ideals. I have recently examined, rather critically, five courses of study with a view of noting the activities suggested. In the best courses, activities are listed so that teachers have a working basis.

"In Nature Study courses we have not yet arranged ideals and activities in the order of importance. How much have we considered this order of importance? Neither have we considered seriously the raising to position of higher order in the list, those ideals and activities which are high in value for children but low in value for adults. This organization of the Curriculum is so important that everything possible should be done right now, while the Curriculum is in court.

"I submit that much of the material of the Curriculum should be in the form of problems that call for special activities in their solution. Time enough should be devoted to each problem to permit concentration and the development of scientific methods of procedure. This calls for large units and very careful procedure. There are now several splendid courses of study from which such units may be selected as examples. 'The Study of Nature,' by Alice Jean Patterson; 'Course of Study in Nature Study,' Toledo Public Schools; 'Elementary Course in Science and Syllabi,' Pittsburgh Public Schools.

"A seemingly important unit is noticeably absent from most of the courses of study. Landscape Gardening, in its simplest forms, provides splendid activities for children of the grammar grades or Junior High School. This connects up so closely with the home and school and tends towards making our surroundings more attractive, that it should receive considerable emphasis. There may be other units that should be included, if a complete survey were to be made.

"The Curriculum does not insure the teaching of Nature Study. It is an important factor. However, without teachers equipped to do this work, it is bound to fail. It is in order to ask that Nature Study or Science, as some prefer to call it, be given a ranking place in every elementary school and Junior High School of the land.

" 'With the recognition of the spirituality of science and the divinity of research and discovery,' writes Arthur D. Little in *The Fifth Estate,* 'should come larger interests and a new breadth of vision to the average man, and to us all, acknowledgment of the steadfast purposive striving shown in the development of the created world and a rich appreciation of man's privilege to aid and further this development. We might reasonably expect ugliness to be replaced by beauty in our cities and small towns and later in our homes. Government by intelligence for the general good of all should supersede government by special interests, blocs, faddists, and fear of organized minorities and the uninformed crowd.

" 'The world needs most a new tolerance, a new understanding, an appreciation of the knowledge now at hand. . . . Ours is the duty and the privilege of bringing home to every man the wonders, the significance, and the underlying harmony of the world in which we live, to the end that all undertakings may be better ordered, all lives enriched, all spirits fortified.' "

Readers of NATURE MAGAZINE will be glad to know that Mrs. Comstock has returned from an inspiring trip to the mid-Pacific. Next month she will tell of the progress of Nature study in Hawaii in this department and her trip has given her the material for several other interesting articles.

Practical Nature Puzzles

By E. LAURENCE PALMER

DURING the last two months you have seen on these pages puzzles which were based upon the structures of birds and mammals which have some significant meaning. There is also something significant in the great variation in the structure of plants. The puzzles this month are based upon these variations. Next month you will have some based upon the structure of fishes. The solving of these puzzles may make you better able to govern your acts so that you may encourage the conservation of useful and attractive wild flowers, and the elimination of undesirable plants. It may also make it possible for you to harvest cultivated plants at their best and to understand why certain plants are able to persist in spite of cultivation.

Most of the puzzles this month are, if anything, easier than those of the preceding month. Next month they may be considerably harder.

Numbers one, two, three and four represent the root systems and means of attachment of various plants. The unbroken horizontal line represents the ground level in one, three and four.

1. Which of these root systems belongs to the pond weed that merely anchors the plant in soft mud, but does not supply it with moisture? ( )

2. Which one belongs to alfalfa which can thrive during a dry season? ( )

3. Which one belongs to corn which may easily suffer because of drought? ( )

4. Which attachment belongs to the Virginia creeper which anchors the plant to the wall, but does not supply it with water? ( )

5 and 6 represent a radish.

5. Which of these would you expect to appear before the plant sends up its flower stalk? ( )

6. Which would you expect to appear after the flower stalk had been constructed? ( )

7, 8, 9 and 10 represent the leaves of plants.

7. Which of these belong to the cattail that exposes broad surfaces to the sun in early morning and late afternoon, but a minimum surface when the sun is straight overhead? ( )

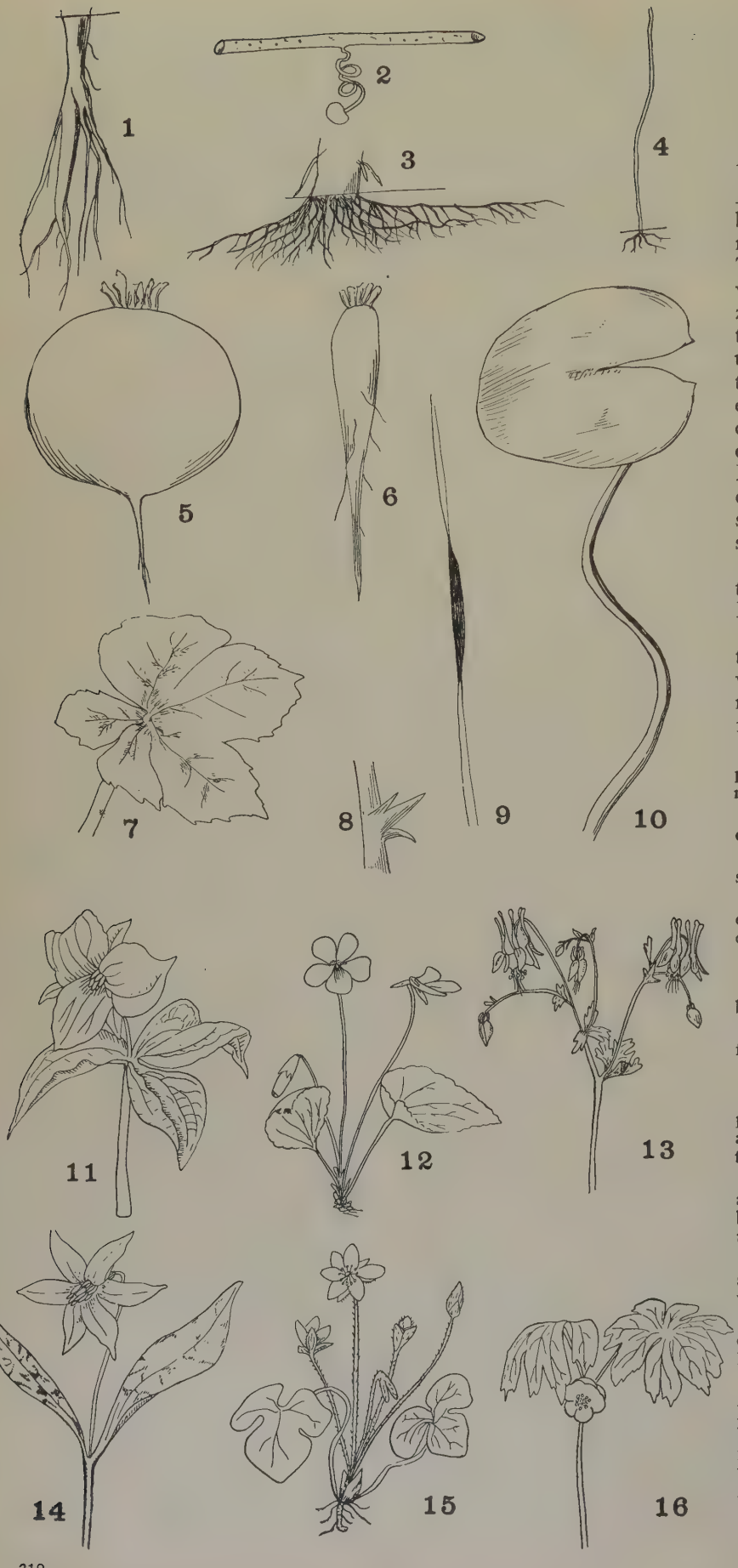
8. Which belongs to a water-lily that grows in an environment where water is abundant, and may be used to help support the leaves in an erect position? ( )

9. Which belongs to a pumpkin that grows in the shade where moisture is generally abundant and where it is compelled to hold itself erect? ( )

10. Which belongs to a Russian thistle which can grow in an extremely dry place and requires little moisture? ( )

11 to 16 are wild flowers. The leaves of plants are, of course, factories which supply the plant with food. When we pick wild flowers we often destroy not only the flower but the entire plant, by picking the leaves as well as the flower.

11. Which of the wild flowers shown would be least likely to suffer through picking? ( )



Answers to April Puzzle

The answers to the puzzles given last month are as follows: humming bird 8; night hawk 6; shelldrake 9; sparrow 2; phoebe 7; heron 5; woodpecker 1; duck 4; hawk 10; crossbill 3; owl 11; hawk 12; plover 14; robin 13. In the second page the heron's neck 1, belongs on the heron's leg 10; loon 6; duck 3; phalarope 4; grouse 8; pheasant 9; ostrich 7; eagle 2; blackbird 5; hawk wing 14; swallow 13; penguin 11; grouse 12; chimney swift 16; hawk 15.

12. Which would be most likely to suffer because of this fact? ( )

The flowers are: 11, trillium; 12, violet; 13, columbine; 14, adder's tongue; 15, hepatica; 16, mandrake.

On this page are shown ways that plants protect themselves, or how they protect the pollen which is essential for maturing seeds. Also there are given some suggestions on how this pollen is transferred from where it is produced to where it is desired, if seed production is to be effected.

13. If you were a cow which of the first four plants would you leave growing the longest? ( )

17 is corn, 18 white clover, 19 mullein, 20 Canada thistle.

21 to 25 illustrate means used by plants in protecting their pollen from insects which will not assist in pollination.

14. Which is the jewel weed that suspends the flower so that crawling insects may not reach it because of its slender support and certain other insects may not visit it because it tips so easily? ( )

15. Which represents the teasel that prevents crawling insects from going up the plant by allowing water to collect in pools around the stem at the leaf bases? ( )

16. Which belongs to the orchid that encloses its pollen-producing structures in an envelope which can be opened satisfactorily only by an insect of a certain size and weight? ( )

17. Which of them belongs to a hawkweed that prevents insects from crawling up its stem by a growth or tangle of hair? ( )

18. Which belongs to the sleepy catchfly that prevents insects from crawling up its stem by bands of sticky varnish? ( )

26, 27 and 28 show three flowers that use entirely different means of pollination.

19. Which is the meadow rue that shakes its pollen into the wind and allows it to be carried by the wind to its desired destination? ( )

20. Which belongs to the scarlet sage that uses an elaborate device to place the pollen on a certain part of a certain insect when it is desired? ( )

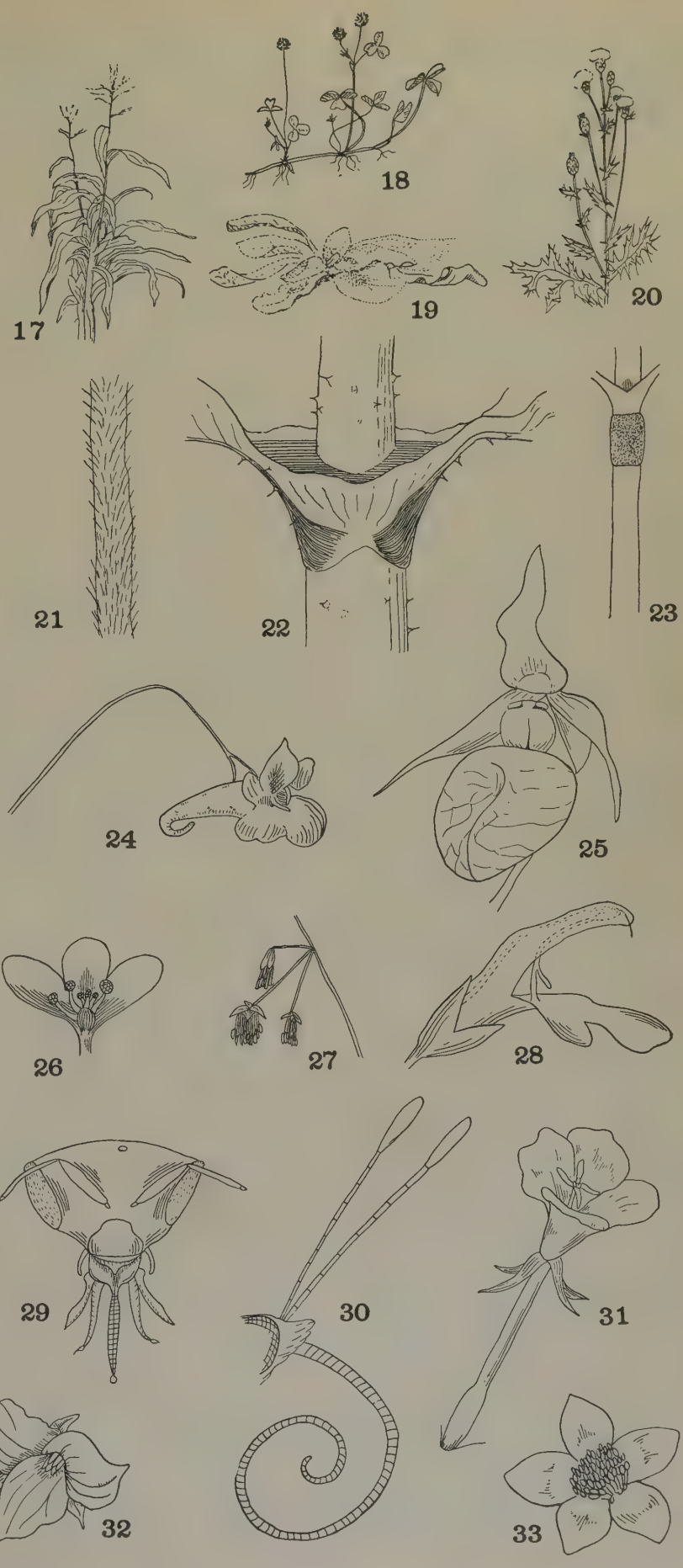
21. Which belongs to the knot-weed whose stamens supply pollen to the pistil in the same flower without the aid of wind or insects? ( )

29 represents the head of a bee and 30 the head of a butterfly.

22. Indicate by number which of these would be most useful and likely to visit number 31 which is an evening primrose? ( )

23. Which would be most likely to visit profitably number 32 which is a trillium? ( )

24. Which would be most likely to visit profitably number 33 which is a marsh marigold? ( )



Hints to Nature Readers

By ELIZABETH K. PEEPLES
Instructor of Natural History, Washington, D. C.

This discussion of articles in the Magazine, together with hints to teachers and other readers on how to use them, is proving most helpful in Educational Work

Bloodroot Wildflower study is one of the chief delights of the spring season. This brief article on the bloodroot tells how it looks and where it may be found, the origin of its name and the uses to which it has been put. A plea for its protection is strengthened by the argument that when picked it loses its petals at once. It is listed by the Wild Flower Preservation Society as a flower which may be picked in *moderation,* if the roots are not disturbed and plenty of flowers are left to go to seed.

* * *

The Big Wolf of the Timberlands Relatives of our most beloved domestic animal have a special claim upon the interest of children. This cousin of man's best friend is a creature not without attraction, fierce as he is. An open-minded survey of the odds against him, and his resourcefulness in meeting them, will enlist the sympathy of the class and arouse a desire in them to know more about the timber wolf. A picture of unusual beauty supplements an account which gives ample information for a lesson.

* * *

The Mountain Bluebird Those in the Rocky Mountain States may learn to know the mountain bluebird by observation, and put out bird houses for it. Those of the East and the Pacific slope, when studying the bluebirds native to their sections, will find this description of a close relative good reading. The riddle of the variations in color of bluebirds of different ages and different geographic sections is worth thought and discussion, even though naturalists have so far failed to reach its solution.

* * *

American Azaleas Soil conditions necessary to the growth of the azaleas are carefully described. To plant the varieties named in the closing paragraph of the article, in home or school gardens where such conditions prevail, would be to insure a succession of bloom which would "make that garden an enchantment." A class supplied with azalea blossoms in its own garden has exquisite material for flower study—a fitting and beautiful climax to the lessons learned in growing the plant.

* * *

Blue and Copper That the garden should be the laboratory of the Nature student is well demonstrated in this article. The time of year has come when material for fascinating Nature lessons is to be found in our garden laboratories in the form of butterflies. Patient observation will reveal not only the characteristic markings, range, and habits of these gorgeous little creatures, but their life cycle as well, since their chrysalises, caterpillars, and eggs may be discovered on favorite food plants. If a good magnifying glass be part of the observer's equipment, much will be learned of the perfection of each minute detail.

* * *

The Water Lily The ease with which water lilies may be grown should make them much less unusual than they are, even in small gardens. After describing various kinds of water lilies, the article tells in the last three paragraphs how to start a lily tub or pool. Here is a novel project, simple enough for all to work out, and rich in its reward.

* * *

Where the Bottle Stoppers Come From The cork from a bottle is sufficient point of contact for study of the cork oak whose picturesque habitat, peculiar ability to withstand girdling and to renew the bark removed, and manifold uses from ancient times to the present are matters of interest in the field of geography. The time and method of harvest and manufacture, the rotation of the crop, and the possibility of growing cork oak in America are also presented in the article. As projects reports should be made on how modern inventions have increased the demand for cork, and a museum collection of articles made from it should be formed.

* * *

The Carolina Gray Squirrel Because of its familiarity and interest the squirrel is a particularly attractive Nature subject. Parents and teachers will find a perfectly prepared Nature lesson in this article which tells of the intelligence, special adaptations, winter and summer homes, mating habits, the young, the maternal care, the enemies, and food habits of the squirrel. The little creature's relation to man, with special emphasis on the help which he may give it, should be stressed in teaching, as it is throughout the article.

* * *

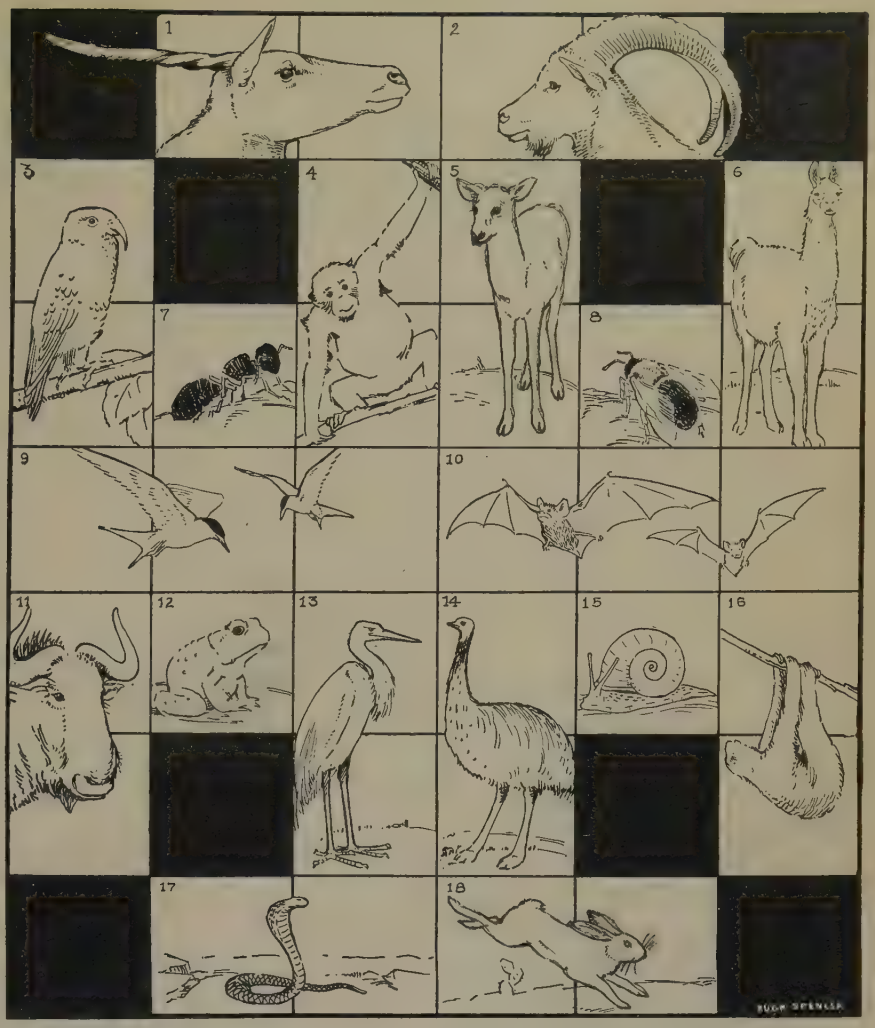
The Great Rainey Bird Sanctuary Nature students should read this account of the establishment of the Rainey Bird Sanctuary in connection with bird study. It gives an idea of the topography of the tract so especially suited to wild life, enumerates some of the birds found there, tells how the sanctuary came into being, presents the feeding and nesting problems which have arisen with the preservation of the highly migratory ducks and geese of North America, and describes the effort being made on the Rainey tract to meet that problem, and the cooperation of the Federal Government with the Audubon Society. One should be reminded that even a small city yard may become a bird sanctuary. Bird baths and nesting boxes should be made and properly placed, and the most suitable food plants studied and set out.

* * *

The Value of Nature Study in Camp The parent or teacher uncertain of her ground will find in this article certain paramount aims in Nature Study stated with utmost clarity. The advantages of outdoor Nature lessons and above all of twenty-four hours a day of outdoor living as experienced in camp are too obvious to need argument

A "Cross-Creature" Puzzle

Here are eighteen members of the Nature world called upon frequently by the makers of the cross-word puzzles. Read the descriptions, see whether you can identify them and see NATURE MAGAZINE for June for the answers.



HORIZONTAL

1—The largest African antelope. It is as large as a full-grown horse, has a smooth coat of rich fawn color, is gentle and easily killed and is therefore nearly extinct in its native haunts.

2—A swift and agile denizen of the high places, related to the wild goat and distinguished by large horns in the ram. There are various species; that which inhabits the precipitous heights of the Himalayas is best known by the name of ——.

7—A small social insect of the order *Hymenoptera*. It is distinguished for its wonderful organization of its life, its insect civilization and its industry. (See NATURE MAGAZINE for April, Page 252.)

8—One of the Hymenoptera whose tongue is capable of sipping nectar from flowers. Its head and thorax are covered with hairs and its hind legs and feet are dilated. It has its habitat throughout the world, preferring warm and temperate climates.

9—A small gull-like bird marked by its long, slender bill and the narrow nostrils that extend at its base. Seemingly almost ceaseless in flight, it is an active bird, feeding on small fishes. In color it is black on the head and neck, with upper parts ashy gray, under parts white and bill, feet, and legs black or red. There are many species, some of which have suffered from plume hunters.

10—A small mammal equipped for life in the air by wing membranes stretched between the greatly prolonged bones of the hand. It has remarkably sensitive hearing and great agility. It depends upon its sense organs to guide it.

12—A cosmopolitan amphibian represented most commonly in the United States by *Bufo*. It is terrestrial and nocturnal, possessed of an agile tongue, an unattractive appearance and none of the dangerous qualities that are frequently attributed to it.

15—Frequently referred to as one of the gastropodous mollusks. It belongs to an immense family, the typical genus of which alone embraces 6,500 species.

17—A deadly reptile which possesses a faculty for spreading out the sides of its neck when angered. Its poison fangs are permanently erect and frequently death follows close upon its bite.

18—Vegetarian rodent, timid, alert, with a peculiar leaping movement. It is prolific in offspring, confines its life to the land and is frequently adopted as a pet.

VERTICAL

3—A New Zealand member of the parrot family with a powerful beak and marauding habit. (See NATURE MAGAZINE for March.)

4—An anthropoid recently the center of much religious discussion and always a moot question when man studies his ancestry.

5—The female of a gentle and beautiful animal of the woods, timid and graceful.

6—Domesticated relative of the huanaco, the males being used as a beast of burden in South America. The females supply milk for native diet and produce only one offspring a year.

11—A species of wildebeest. It resembles a horse, buffalo and stag at the same time. It is about the size of a medium-sized horse, has rough horns, a thick and shaggy beard under the lower jaw, a stiff, erect mane on its neck, long and finely formed legs and an oblong tuft of stiff black hair turned upward on the foreface.

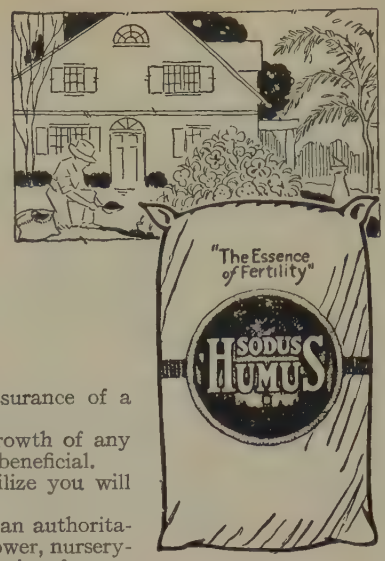
13—A species of white heron distinguished for its grace and its plumage. It feeds upon small quadrupeds, fishes and other smaller kinds of life. The feathers on the back are elongated and prized for ornament. There are several European and American species that bear the name ——.

14—A bird of the plains of Australia, feeding on fruits, herbs and roots, about five feet in height and one of the few representatives of the genius *Dromaeus*. Its head and neck are feathered. It has a gracefully arched back, rich brown plumage, three toes on each foot and lays six or seven green eggs in a nest scooped from the sand. It can readily be tamed.

16—An edentate mammal of aboreal habits. The best-known members of the family are the unau, with two toes, and the ai, with three toes.

The April Puzzle

NEW HEALTH and VIGOR For WORNOUT SOILS



You cannot keep taking from the soil and continue to get a par yield from it.

Put back into it that all-important element upon which plant growth depends—*Nitrogen*. Of all humus—and tests prove it—

SODUS HUMUS

The Essence of Fertility

is richest in nitrogen. Its use is positive assurance of a maximum yield from the soil it fertilizes.

If you are engaged or interested in plant growth of any kind, you will find the use of Sodus Humus very beneficial.

Try a 2-bushel sack and whenever you fertilize you will prefer SODUS. Sweet and odorless.

"Humus and its Relation to Plant Growth" is an authoritative book which any farmer, gardener, flower grower, nurseryman, estate manager or greenskeeper may receive free on written request.

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192 Main Street, Benton Harbor, Mich.

WREN WREST

2 for $1.00

WRENS frequently have three broods a season and are the most delightful of all song birds. Provide more than one nest and attract several of them. Wrens prefer bird houses to any other kind of shelter.

The Wren Wrest is staunchly made of heavy sheet iron, and painted attractively in a bright green. **It** is weatherproofed and will last a lifetime.

Mail money or postal order to
WREN WREST COMPANY, Coldwater, Mich.

Give Your Canary A Highball

Prevents Hunger
Gives Exercise
Stimulates Song

15¢

Suspended by a string in the cage, a KAEMPFER CANARY HIGHBALL will give your canary strength-building exercise and prevent hunger. A compound of the most nutritious food and tonic. Stimulates song and health. Send for one today. Enclose 17c in stamps with order (15c for **Highball** and 2c for postage).

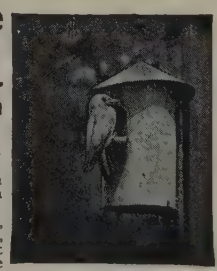
KAEMPFER'S
30 E RANDOLPH ST.
CHICAGO

New Design Colonial Solid Brass Bird Cage

Valued at $12.00. Our special introductory price is $6.00. We pay the postage. Your money back if not satisfactory. Only a limited number will be sold, so send your order at once.

AMERICAN CAGE CO.
514 18th St., Racine, Wisconsin

Now Is the Time
To Put Up the PACKARD



Bird-Houses $1.00 Each
Why Pay More?

Used, approved and formally endorsed by the Massachusetts Audubon Society for the Protection of Birds.

Featherweight, durable, ventilated, unobtrusive, easily cleaned, easily put up---and the birds love them.

When ordering, add postage. Weight, packed, 1 house, 3 lbs.; 3 houses, 6 lbs. Parcels Post. Everything for Wild Birds. Catalogue free.

Address WINTHROP PACKARD
1433 Washington St. Canton, Mass.

Baltimore Oriole
Pictures—7x9 inches

Dodson Bird and Nature Pictures

Send for them!

The loveliest color pictures in existence—made from the famous MUMFORD plates, accurate and authentic! Order these beautiful color pictures of the birds, flowers, fruit, animals, minerals, etc. They create enthusiasm for the beautiful things of nature. You'll need them this spring. Ideal for school-room or home. Send fifty cents for 17 pictures and complete list of 650.

Joseph H. Dodson
911 Harrison St. Kankakee, Ill.

Mr. Dodson is Famous as the Original Bird House Man

A New "Thriller"

"Laying Lumbricus Low" is the alliterative title of one of the latest film releases, and the producer is none other than Uncle Sam in the person of the Department of Agriculture. It is a film to gladden the heart of the man who takes more than his two putts to a green and the home owner whose lawn goes bald in spots. It is the romantic story of Don Duffer, a golfer, and Jack Handy, a home owner, with the villain of the piece being none other than Lumbricus terrestris, better known as "fishworm," the bane of green-keepers and lawn-lovers. Copies of the film may be borrowed or may be purchased.

Not Guilty!

Sportsmen in the vicinity of Pyramid Lake, Nev., and fishermen from afar who came to try their luck there, said unkind things about the pelicans who nest in a colony of some 10,000 on Anaho Island. They alleged that the pelicans ate the trout and were doing vast damage to fishing. The United States Biological Survey investigated. The meals of many pelicans were examined over a three-month period. The charges were disproved because it was found the pelican, not being a diver, rarely goes under for the deep swimming trout. Instead, this bird of the proverbial bill lunches and dines on fish of small and coarse-fleshed species not valued as food by man, such as lake minnows, carp and lake chubs, with a few red suckers, Sacramento perch and catfish.

Yosemite Notes

With the new year the Nature Notes, compiled by the park naturalist of Yosemite National Park, C. P. Russell, appear in attractive booklet form, printed from type, replacing the old mimeographed sheet form. In this new little volume Ansel F. Hall, chief naturalist of the Park Service, writes: "The parks were set aside by our foreseeing fathers that they might always be ours. Then decades were spent in preparing the way for us that our physical wants might be satisfied, and now, at last, we are ready to take away from the parks an inspiration based on understanding."

Ask your friends to read
NATURE MAGAZINE

A Garden Full of Dahlias for $3.50

New and Rare Exhibition Dahlias

Few flowers, whether used for garden decoration or principally for cut blooms to decorate the home, are as responsive to simple garden culture as our Modern Dahlia. It has made wonderful advancement in size of bloom, habit of growth and profuse blooming qualities.

In order to further its now great popularity, we are offering this collection of

12 Dahlia Tubers for $3.50

—one each of 12 distinct varieties, not labeled, which if purchased separately according to name would cost not less than $10.00.

Order Your Tubers Now so as to have them ready to plant any time after the tenth of May or when all danger of frost is past.

Mail this advertisement, or present at our store, with check, money order, cash or stamps, and secure this exceptional collection, sent prepaid to any point in the United States.

Our 1925 Spring Seed Annual sent on request

Stumpp & Walter Co

30-32 Barclay St. New York

If Every Gardener Knew What Some Gardeners Know

There never would be any doubt about success with Water-lilies. You can have these dainty flowers—white, yellow, pink, purple, red—from mid-June to autumn. No trouble; a tub or pool, a little soil and plenty of water, meet their needs. Hardy varieties may be planted in late May; tender varieties in June.

My New Catalogue

pictures half-a-dozen Water-lilies in natural colors, tells how to plant and care for them, and describes the best kinds for pools and ponds. Send for the catalogue today and plan for an uncommon garden this summer.

WILLIAM TRICKER

669 Forest Street, Arlington, New Jersey

Waterlilies

For Small Gardens

A little water, a little earth, and even less attention; so easy you will be surprised, for Lilies thrive in tubs or pools.

Send for our **free catalogue,** with colored illustrations, describing fragrant day and night blooming Waterlilies, and how to grow them.

INDEPENDENCE NURSERIES CO.

Box D Independence, Ohio

The "Bob-o-link" Bird Bath

Especially priced and designed for the medium-sized garden, in excellent proportion and of proper size and depth to suit your feathered friends. Made of either Crushed White Marble or Granite, as you prefer, by our special process, which allows us to fully warrant our products to remain beautiful and serviceable through time and weather.

Price $13.00

Securely crated and F. O. B. the railroad.

Please specify "Marble" or "Granite" when ordering.

Our beautiful catalog of all kinds of Garden-ware sent upon receipt of 20 cents in stamps, to be refunded with your first order.

No. 410—Height 32"; Saucer 23¼" Wide, 1¾" Deep

THE BARCLAY COMPANY

Garden-Ware

Narberth Penna.

RAIN

"When, Where and as long as you want it"

If you have ever wished for rain, then you will be interested in our new book, "Rain." It tells a lot of new facts about watering—how to get real results in your garden or lawn with less labor. Whether your place is small or large, the book contains many valuable suggestions. When writing for your copy today, mention whether you are interested in lawn or garden watering.

Send for this book —it's Free!

The Skinner Irrigation Co.

216 Water St. Troy, Ohio

Service Wagon

Wonderful new invention. Has 1001 Uses—better than a maid—invaluable when entertaining—Saves Time, Labor and Steps. Has Large Top—3 Deep Shelves—Extra Glass Tray—2 Handles—4 Silent Wheels. Write for Picture Pamphlet and dealer's name to

FREE COMBINATION PRODUCTS CO.

Dept. N400 Cunard Bldg. Chicago, Ill.

WATER-LILIES—FOR THE GARDEN

Seventy-five varieties to select from

Wholesale and Retail

THE W. B. SHAW AQUATIC GARDENS

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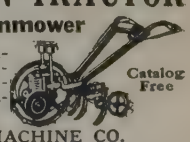
KINKADE GARDEN TRACTOR

and Power Lawnmower

A Practical Proven Power Cultivator for gardeners, suburbanites, Truckers, Florists, Nurserymen, Fruit Growers, Country Estates and Lawnwork.



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AMERICAN FARM MACHINE CO.

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No. 3 WREN HOUSE CLUSTER on 8-ft. pole; stained brown; removable bottom. Delivered, $6.00.

No. 5-A WREN HOUSE; stained brown; with 8-ft. pole, etc.; delivered, $2.50; house ONLY, delivered, $1.00.

WOODPECKER or FLICKER HOUSE, 20 1/4" high; may be applied to side of tree, house or barn; stained brown. Delivered, $2.00

FEEDING STATION attracts birds; assures you daily visits next winter; stained brown. Delivered, $1.00.

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No. X-15 EZY-CLEAN MARTIN HOUSE; ready for paint; 3-story, 28 comp.; delivered, $11.50; 2-story, 20 comp.; delivered, $9.50.

No. X-10 STONE BIRD BATH. Where this beautiful bird bath is placed, there will always be songsters. Scientifically correct; of classic design; bowl 21" diam.; pedestal, 26" high. Delivered, $12.00.

We suggest early installation of these bird comforts to attract to your garden the first arrivals from the south.

SHIPPING CHARGES PREPAID. Write for our beautifully illustrated catalog on garden furniture.

GARDEN CRAFT DEPT.
EXPRESS BODY CORPORATION
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ROBIN ROOST for the Redbreast who will not build in a house; stained brown. Delivered, $1.00.

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Everything for the Aquarium Lover

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Complete illustrated catalog mailed on receipt of 5c stamp.

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WHY NOT spend Spring Summer and Fall gathering butterflies, insects? I buy hundreds of kinds for collections. Some worth $1 to $7 each; simple outdoor work with my instructions, pictures, price-list. Send 10c (not stamps) for my Illustrated Prospectus before sending butterflies.

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Bring back the same birds year after year

An Exceptional Value

Only $1.00 Delivered—4 for $3.50

There is nothing that beautifies your grounds so much as bird houses.
You can spend many happy hours watching the birds and enjoying their songs.
Lincoln Wren Houses are real log cabins built from sturdy brown logs, and last for years. They come "knocked down" and are put together in a jiffy.
Remember wrens have two broods each year.

See your dealer or send coupon

JOHN LLOYD WRIGHT, Inc.
Room 157, 232 E. Erie Street, Chicago

Please send, postage prepaid: **1 Lincoln Wren House $1.00**
4 Lincoln Wren Houses 3.50

With the understanding that you will refund my money if for any reason I wish to return the Bird Houses after five days. I enclose herewith $_____

Name _____ Street _____

City _____ State _____

An Alaskan Viewpoint

The following comment on the question of the bounty on the head of the American eagle is made by J. P. Anderson, of Juneau, Alaska:

"No one here wants the eagle exterminated but the fact remains that the eagle is a bird of prey and when man comes in and takes large numbers of beasts, birds and fish—especially the latter here in Alaska—and thereby disturbs the balance of Nature, it may become necessary for him to take measures to reduce the species that subsist on the forms of life he desires for himself. The bounty has succeeded in only slightly reducing the number of eagles in the most thickly populated sections, while there are tens of thousands of square miles that are practically uninhabited. . . . Personally I am a conservationist but believe that harm is done the cause by overenthusiasm and lack of knowledge of true conditions."

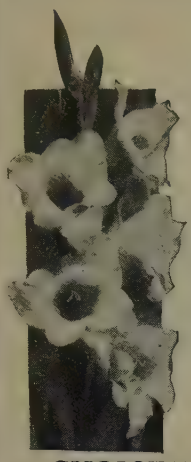
A Town With Vision

Warwick is a little town in Massachusetts with 327 inhabitants and 122 registered voters, and a valuation of $588,000. At its recent town meeting it voted $600 to buy 100 acres for a town forest. This means a tax of $1.83 for every inhabitant, but the citizens of Warwick are conservationists. They unanimously decided that the 100 acres, now largely forested with white and hard pine from ten to fifteen years old, was worth making into a local forest supply, a bird sanctuary, a recreation area and adjunct to the schools. The town will take advantage of the offers of the Massachusetts Forestry Association and the New England Box Company to give 5,000 trees each to the community setting aside 100 acres or more.

Bill Fails to Pass

Again a session of Congress has adjourned without passing the so-called Public Shooting Grounds-Game Refuge bill. The measure, considerably amended and somewhat weakened, was passed by the House of Representatives on February 21. The measure as approved by the House authorized the appropriation of $50,000 for the acquisition of marsh and water areas suitable for refuges for water fowl and to serve as public shooting grounds except during the closed season. It contemplated raising funds from hunters' licenses of one dollar each, 60 per cent of such sums to be devoted to the purchase of marsh lands. In its last few days the Senate was so concerned with other matters that it was impossible to gain consideration for this measure.

GLORIOUS GLADIOLI



From July to Frost

Plant now and every three weeks till July 1 and enjoy a long processional of beautiful bloom—

To give you this pleasure and at the same time acquaint you with the remarkable quality of Schling's Bulbs we make this very special offer—

100 BULBS $3.75

CHOICEST MIXTURE

(Splendid Value at usual price, $7.00)

Choicest assortment of the latest and most beautiful varieties, including the lovely Primulinus or Orchid Gladioli, running a gamut of subtle pastel shades from ivory yellow to iridescent coppery bronze such as mark the finest nasturtium collections. This collection will be the pride of your garden and a joy to all who behold it—better double the order if you have room for them—you won't have a bulb too many.

N. B.—Send for our ***Import Bulb List*** and save money on bulbs.

Schling's Bulbs

618 Madison Ave. North, N. Y. City

Strong-Rooted, 2- or 3-yr.-old Bushes: nearly 2 ft. high

To add quickly 1000 more customers we make this remarkable **SPECIAL OFFER** on the finest, fragrant varieties:

COLUMBIA—newest big pink; GOLDEN OPHELIA—rich yellow; PREMIER—rose pink; DOUBLE WHITE KILLARNEY—ivory white; AMERICAN LEGION—fragrant new deep red.

Every bush has already bloomed. Guaranteed to grow and bloom for you, or money back. Pick regular, long-stemmed, hot-house roses all summer and till frost comes.

ACT NOW Low price holds good only till limited number of collections is sold. Send $1.95 today—all five bushes mailed *postpaid* to your home when planting season opens. If beyond the Mississippi River, add 10c.

FREE *Collins 1925 Guide to Roses, Evergreens, Fruit, Grape Vines, Berry Plants, etc.; in colors.*

COLLINS NURSERIES

Est. 1860. Arthur J. Collins & Sons, Inc.

Box 96, Moorestown, New Jersey

400 acres in nurseries and fruit trees

Frost-Defying Chrysanthemums

A Special Opportunity

A choice assorted dozen of beautiful varieties from pots will be sent you for $2.00, 25 for $3.75. Plant them now for October flowers.

Postage prepaid East of the Mississippi.

MOONS' NURSERIES

MORRISVILLE PENNA.

Encouraging the Birds

From Dr. George W. Field, of Sharon, Mass., we have received an account which shows some of the results that may be obtained by encouraging birds about the home. Dr. Field has a large tract of old farm land which he has made a bird refuge. During the summer of 1924 no less than 18 pairs of birds took advantage of the protection afforded and built their nests within 100 feet of the dwelling house. The species so breeding included six pairs of robins; two pairs of phoebes; two pairs of chimney swifts; and one pair each of the following: Flicker, tree swallow, barn swallow, catbird, song sparrow, cedar bird, redstart and yellow warbler. Besides these, dozens of others, including woodcock and ruffed grouse, nested in the fields, woods and thickets surrounding the dwelling.

Pine Institute

At a recent meeting of dealers in naval stores a committee on permanent organization presented a report urging the creation of the "Pine Institute of America" to provide an instrumentality for research and service in the field of naval stores production. The committee particularly emphasizes the need of conserving Southern pine forests and reforesting lands already cut over, pointing out that the industry is continuing "to consume the corpus and the income of our forestry estate."

A Noble Oak

An unusual white oak has been found near Blairsville, Pa., with a circumference at four and one-half feet from the ground of sixteen feet. The oak stands 92 feet high with a spread of branches of 80 feet. Eleanor R. Ray, Blairsville, writes that the community is particularly proud of the tree and that it has aroused no little interest in trees, one evidence of which is the planting of a number of Norway spruces by the local D. A. R. Chapter.

"Apres Moi le Deluge"

This famous saying of French royalty might well be adapted to the forest fire, according to Page S. Bunker, Alabama State Forester. No small factor in making severe the recent floods in that state were the heavy forest fires of the fall, he says. Sweeping the forest floor, the fires removed the normal obstructions of pine straw, leaves, decaying twigs and other litter and the rains found nothing to stop their pouring into the streams, swelling them until they burst roaring across the lower country.

Choose Early— and Pick the Best—

from the finest bulb gardens of Holland

For nearly forty years, Elliott's have been America's foremost bulb specialists, bringing to American gardens each season the cream of Holland's crops. Because they are selected *early* by Elliott representatives right in the growers' fields, Elliott bulbs are big, full of life, sure to grow and bear the largest and most beautiful flowers.

Special Offer—Giant Tulips

Flowers often 3½ inches in diameter; stems over 2 feet tall; bloom in May.

Elliott's quality bulbs of ten beautiful named varieties.

Baronne de la Tonnaye. Vivid pink.
Bronze Queen. Buff and golden bronze.
Clara Butt. Delicate salmon-pink.
Dream. Beautiful lilac.
Euterpe. Mauve-lavender.
Farncombe Sanders. Fiery scarlet.
Faust. Velvety maroon-purple.
Glow. Deep vermillion.
Philippe de Commines. Violet.
Pride of Haarlem. Deep old-rose.

At Special Import Prices—

Collection A	100 bulbs,	10 of each,	**$4.95**
Collection B	250 bulbs,	25 of each,	**11.75**
Collection C	1000 bulbs,	100 of each,	**45.65**

Above special offers good only until July 1. Order now. You can pay when bulbs arrive in September, or take 5% discount for cash with order. Complete directions for planting and care sent with every order.

Free—The 1925 Bulb Book

Elliott's Import Bulb Catalog is the most complete and helpful book of its kind ever offered to American gardeners. It tells the best and easiest ways to grow Hyacinths, Tulips, Daffodils, Lilies and many other bulbs, indoors and out, and describes thousands of the best varieties.

The special import prices quoted in Elliott's bulb book are good only until July 1. Make sure of getting the best at the season's lowest prices.

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Act NOW!

Only 300 French Aviator's BINOCULARS

While They Last! $7.95

These are all we have left of a lot of genuine imported Champiere field glasses, bought when the French rate of exchange was lowest. "Champiere" glasses are known everywhere for optical and mechanical perfection.

See distant objects as though they were near you. Wonderful at prize fights, ball games, boat races, horse races, aboard ship, on hikes and auto trips. An ideal gift. This splendid glass has 8 lenses of finest optical glass, over 1⅝ inches in diameter. Wonderful light-gathering power and sharp definition. Middle bar graduated from 1 to 12 for quick reference.

Only Galilean Glass With 8 Lenses Selling Under $30.00

Only 4⅜ inches high closed. 6½ inches extended. Great range. A good compass is attached to top bar. Tubes engraved, "High Power Aviator's Glass," or "Army Long Range." Each instrument equipped with neck-strap loops and supplied with handsome case and straps. A wonderful bargain. Only 300 more at $7.95.

Order Direct From This Ad

We will send you this fine instrument under our absolute money-back guarantee. Examine it without obligation. Either the glass makes good with you, or you send it back and we return your deposit instantly. The next lot of these famous glasses will cost more. Just mail the coupon now, with remittance, before this big bargain offer is withdrawn.

FREE Catalog of Over 200 Glasses

The world's finest binoculars, 3 to 24 power. Telescopes for sport, observation, target shooting, etc. Most complete line in this country. All our goods are BRAND-NEW. No "salvaged" war glasses or "seconds."

Write to America's Leading Binocular House.

DU MAURIER COMPANY, Dept. 85, Elmira, N. Y.

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Elmira, N. Y.

You may send me the "Champiere" French Aviator's Binocular, as described. I enclose remittance of $7.95, but you are to return it promptly if I decide to return the glass for any reason.

☐ Check this square if you wish us to send catalog only.

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Address_____

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A Lesson for Youth

At the age of sixty-eight, Dr. George W. Finley, Health Commissioner of Clay County, Indiana, started to plant trees on a rugged corner of his father's pioneer plantation at Brazil, dedicating this section as a memorial. In two years he has set out twenty thousand trees, and already this plantation is becoming a bird sanctuary. For the past seven years Dr. Finley has been an active advocate of reforestation, speaking frequently to arouse the young people to plant trees in the interests of health and good citizenship. He has been instrumental in the success of Arbor Day programs and has furthered much memorial tree planting.

Fur Farm Census

Census of the fur farms and the fur farmers in the United States is being taken by the U. S. Biological Survey in order to determine the extent to which commercial enterprise in this direction has grown to repair in some measure the inroads the past has made into wild life resources. The Survey is gathering material on foxes, skunks, raccoons, minks, muskrats, opossums, martens, squirrels, beavers, fishers, rabbits and other fur bearers which may be raised in captivity. The known farmers are being asked the extent of their enterprise and statistics, and a list of such farmers will be compiled.

GERMAN ARMY OFFICERS'

FIELD GLASSES

Brand New

8 Power $9.85 Postpaid

Genuine German War Glasses purchased at exceptionally advantageous rates of exchange. Manufactured by most prominent of German optical factories. Many were received direct from the Allied Reparations Commission. Conservative $20.00 value.

Finest achromatic day and night lenses, 40 mm. objective, dust and moisture-proof. Pupillary adjustment. Built for service regardless of cost according of strictest military standards. All glasses guaranteed in perfect condition. We have sold 50,000 pair of these glasses to date. For the races—rail and ocean travel—for bird and nature study—hunting or motoring—for the summer home. Shipped promptly upon receipt of check or money order for $9.85, under positive guarantee of full cash refund for any glasses returned. Carrying case $1.00 extra.

Order your field glasses today

HENDERSON BROTHERS

Largest Importers of Field Glasses in America

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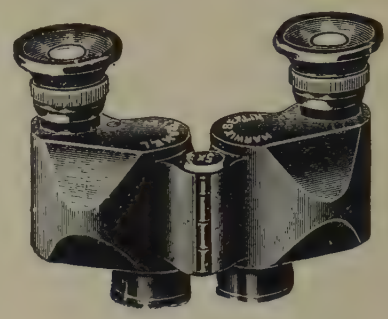

WIDE FIELD

This is the same powerful little glass used by members of the American Nature Association on all of their expeditions.

Used for all purposes. In the Mountains, at the Seashore, Motoring, Camping, Boating, Hiking, Exploring, Bird Studying.

$22.50

Complete with Leather Case and Strap or Soft Suede Pouch

Order at once from

MIRAKEL DISTRIBUTORS

1214 16th St. Washington, D. C.

A GLASS WORTH LOOKING INTO

FOCH Royal Air Force

Ideal Vacation Companion

$14.95

Complete with Leather Case & Shoulder Straps

For Yachting Touring, Racing and the sports, you will wish for nothing finer than this 8 Power field glass, 24 ligne objective; truly named the "Eyes of the French Air Forces." Mechanically and optically perfect with clear vision; gun metal mountings and sun shades. Regular $25.00 value, special at $14.95, with shoulder straps and case. Order direct from this advertisement. Satisfaction guaranteed.

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258 Broadway, Dept. 434, New York City

Geneva Binoculars

"Brings the view close to you"

Finest glasses the money will buy

A glass for every use and every pocketbook

4 to 20 Power
$12 to $60

Every glass sold on 10-day trial and guarantee of absolute satisfaction or money back. Get the Geneva price list first.

Send For Descriptive Circular Today

Geneva Optical Co., 39 Linden St., Geneva, N.Y.

The Mocking-bird

A tribute to the mocking-bird has enriched the frequently dull pages of the *Congressional Record* with the reprinting of an address delivered by John E. Rankin, representative from Mississippi. In his address Mr. Rankin declared: "We dignify as a national emblem the American eagle that soars and shrieks his screams of defiance from the seclusion of the crags; we perpetuate in verse and story the imaginary song of the mythical dying swan; we praise the inferior songs of others birds, but, in my humble judgment, there is none that deserves more praise, credit, or commendation at the hands of enlightened humanity than the peerless mocking-bird, America's sweetest singer, who enlivens the spirit of springtime with its tireless serenade, and thrills every heart with his inspiring note of gladness as he touches the golden harp of nature's sweetest song and 'stirs with love and hope the languid souls of listening men.' "

Green Mountain Forests

An active interest in reforestation in Vermont that promises to use up all the available nursery stock of the state before the time comes for distribution, is reported in a little pamphlet entitled *The Green Mountain State Forest News,* gotten out by Robert M. Ross, State Forester. Through this little pamphlet Mr. Ross is doing a fine work in arousing interest in the state, which for a time was without forestry leadership owing to lack of appropriations.

Farm Nature Study

A valuable pamphlet for teachers is that issued by the College of Agriculture of the University of California and entitled, "Outlines of Course of Instruction in Agricultural Nature Study for the Rural Schools of California." The brochure has been revised as of December, 1924, and, although its title suggests restriction to the rural schools, it applies equally well to all elementary schools. Besides various general teaching suggestions, it contains outlines for all grades from the first to the eighth, inclusive.

Far and Wide

Reports from the discoverers of two herons banded by S. G. Emilio, of Danvers, Mass., in June, 1924, provide an interesting travel record. One heron was taken in September at St. Justine, Bois Blanc, Quebec, and the other in December at Valona, Ga.

WHEN THE SPORTSMAN'S DAY IS DONE—

Then come the golden hours of relaxation. The music of frying fish—the pipes around the campfire—the yarns of the day just ended, and the plans for the day to come.

RUSTIC HICKORY FURNITURE—A Reflection of Nature's Beauty

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The Lynx Family

There are two general types of Lynx, or Wild Cat, ranging in the United States. Each one of these is divided into several related species. The Canada Lynx ranges in the extreme northern part of the United States and further north, and differs from the Common Wild Cat, or Bay Lynx, in that it is larger and has conspicuous ear tufts. The feet are distinctly larger than those of the Bay Lynx. There are slight differences between its forms, the Canada Lynx, Alaska Lynx and Newfoundland Lynx. The Common Wild Cat has also been divided into eight or ten different forms, varying in color and size in accordance with the different climatic areas inhabited.

Blue Fox Farming

Blue fox farming is the infant industry of southeastern Alaska, says the *Alaska Fisherman*. It has made rapid strides during the past year until there are a dozen large farms within a radius of forty miles of Ketchikan. These farms are located on islands, each farmer securing from the Government a lease on the whole island. These islands average several square miles in size and being surrounded by water the animals are fenced in naturally. The blue foxes increase and multiply rapidly, a pair producing from five to thirteen pups in a season. The average farmer will start with half a dozen pairs and let them increase until he concludes that he has a sufficient number to permit him to sell them alive to other farmers as breeders, or to send the skins to market.

Policy for Idaho

Immediate action looking to establishing a forest policy for the State of Idaho is urged in the *Forestry Bulletin* of the Forest School at the University of Idaho. The bulletin points out that the Governor of the state has set for the problem in the following sentence: "Idaho's people are spending millions of dollars in the construction of reclamation projects and immense dams for storage, and why this expenditure if in a few years our watersheds will not hold the snow." A policy considering three fundamentals is urged and these three are the appointment of a State Forester responsible for the policy; provision of a more rational method for the disposal of slashings from lumbering and a forest fire protection law that will bear equitably on all forest owners.

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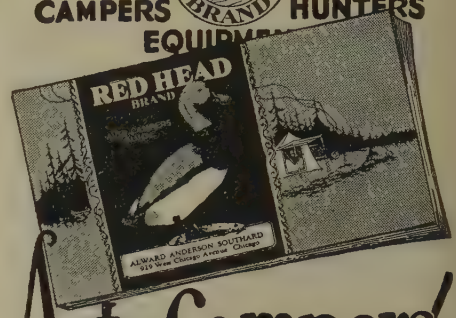

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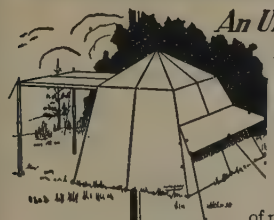

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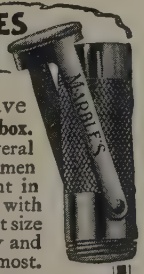

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Growing Redwoods

"Reforestation of Redwood lands has started in earnest and will be continued on increased scale in the redwood region of California," declares *The Redwood Reforester,* published by the Humboldt Redwood Reforestation Association. This association has been formed to perpetuate the lumber industry, investigate reforestation problems in this section and to encourage this activity. It is an admirable effort but does not alter the fact that some of the present 1,500-year old redwood stands should be preserved for posterity.

Roses and Thorns

"As created the rose was devoid of thorns," says Antone J. Soares, writing in *The Flower Grower.* "Science tells us that the rose developed its thorns as a protection against being eaten by hungry cattle, otherwise it would fare badly in its struggle for existence; but mythology has another reason for their origin. We are told that Cupid, while flying aimlessly about, had his attention attracted by a beautiful pink rose. As he bent to kiss it, a bee which was hidden in the flower stung him on the lip. Crying with pain, Cupid ran anxiously to Venus, and demanded, not consolation, but revenge. So the goddess allowed him to pluck the stings from some captive bees, and with these he fringed the rose's stem which heretofore had been without thorns."

Use The Whole Tree

"A more complete use of the tree, through scientific cutting of standardized raw material and through improved methods of remanufacturing raw materials so cut," is the avowed object of *Wood-working Industries,* successor to *Wood Turning.* The magazine is published by H. A. Apple in Milwaukee, and is edited by E. C. Kratsch. The first issue under the new name takes its text from the Forest Utilization Conference held recently in Washington.

To Supervise Forest

Announcement was made that with his resignation as District Forester at Portland, Oregon, George H. Cecil would enter private practice. Mr. Cecil has decided, however, to remain with the Forest Service and will take up his duties as supervisor of the Angeles National Forest with headquarters at Los Angeles.

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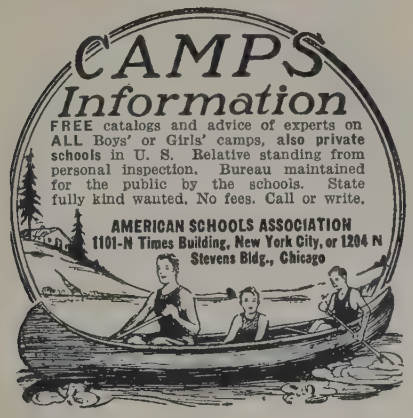
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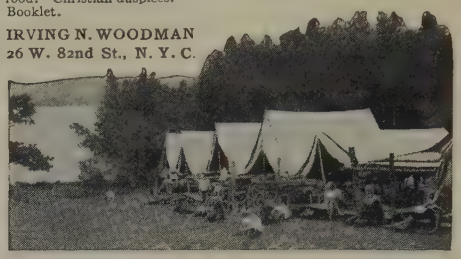

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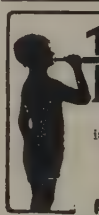

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this is the Garage for Billy
these are the Tennis Courts
Raspberry bushes where balls get lost
the flag
this is Rest Cottage
this is the BUNGALOW
this is the DINING ROOM and KITCHEN
this is the TENT PLATEAU
Big Pine (The View)
Pine Tree Tent
Tent Terrace
Four Lovers
a nest
this is the BUNGALETTE
the bunch of berries
these are Balsam Pine Woods (fine for pillows)
and this is the BUNGLE
this is the
camp fire
boat bailer
Cathedral
the dock
the canoe
these are the floats
the float
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Pickerel grass (good trolling here)
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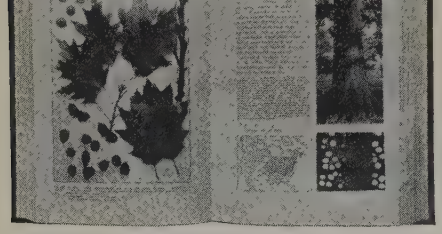

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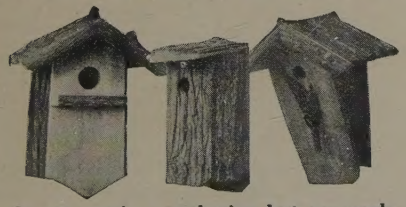

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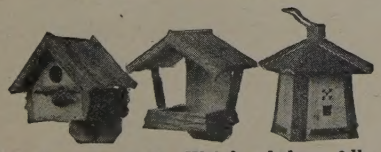

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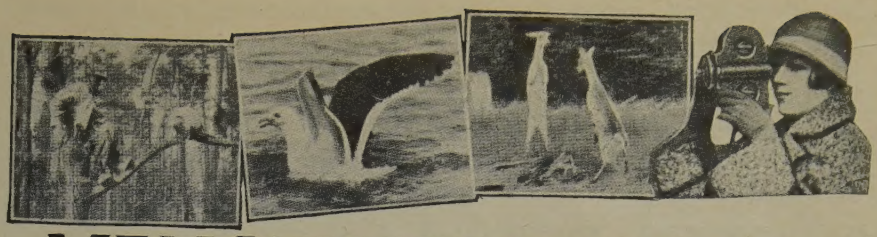

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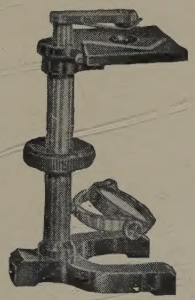

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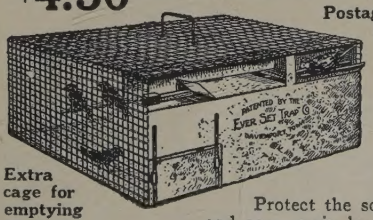

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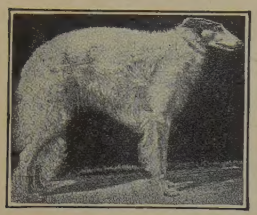

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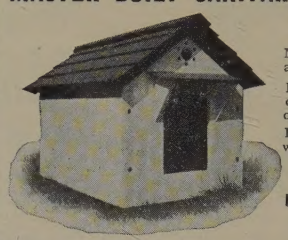

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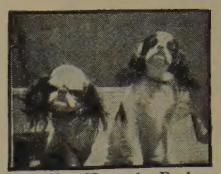

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THE TREE PLANTING ARMY

Thousands of "Good Citizens" were given their "first papers" during American Forest Week.—*Charles Lathrop Pack.*

Thousands of new "good citizens" were given their "first papers" during American Forest Week. The registrations in the American Tree Association are now coming in from all parts of the country. Starting with the planting of trees by the Atlanta Women's Club early in the year the southern tree planters began to register—early. At the direction of Mrs. Norman Sharp the Atlanta Club's tree has been registered on the Association's honor roll. Various club districts in Georgia are planting trees and one of the awards for the best work is the book "Trees as Good Citizens." Mrs. W. W. Stark is reporting on the work. In Mississippi state-wide work is being done. From Canton Mrs. W. R. Baughman sends 21 application blanks. At Picayune Mrs. A. B. Connally has registered 75 tree planters. From Meridian comes 22 registrations. Mrs. Beulah E. Payne registers high school tree planters at Indianola. The Lions Club, the Laflotis Club and the Bible Club rallied the citizens of Cooper, Tex., for tree planting, and G. Fred Turner registered the "good citizens."

At the direction of Mrs. George H. Tomes, 700 Girl Scouts joined the tree-planting army following the tree planting in the Brooklyn Botanic Garden.

The Ohio Federation of Women's Clubs put on a big program for Arbor Day, April 17. The program was given at Columbus where Mrs. W. W. Milar, chairman of the Division of Natural Resources of the General Federation, planned the day. Schools of Columbus had part in the program which was broadcast from Ohio State University. Mrs. Milar is conducting the national tree vote of the Association in the Ohio Federation.

A series of newspaper articles on Youngstown's trees, prepared at the direction of Joseph L. Wheeler, the librarian, have been of great educational value in that city.

One of the biggest programs in which the American Tree Association has cooperated was that in the schools of Indianapolis where hundreds of applications were made for membership in the tree-planting army. Irvington, Calvin Fletcher, Washington, School No. 76, were among the first schools to apply for application blanks. Elizabeth H. Scott, Mildred Weld, Helen Loeper, M. Rinehart, Mrs. Stratton, Marjorie M. Champe, Lydia R. Blaich, were among the first teachers to undertake the work.

Among the schools thus far reached by the Association are those of Huntington, North Manchester, Logansport, Frankfort, Knox, Kokomo, Pendleton, Garrett, Richmond, Danville, Terre Haute and La Grange. The Federation of Women's Clubs of the state carried out big plans for American Forest Week. The Camp Fire Girls, too, are cooperating with the American Tree Association through their National headquarters in New York. To Mrs. O. F. McMeans, the Indianapolis executive, the Association has sent its tree-planting data. Vida Newsom of the committee on Highways and Memorial Tree Planting of the General Federation is preparing a pamphlet for the Federation on that work and calling on all tree planters to join the tree-planting army.

The Boy Scout Reservation near Evansville, Ind., will be planted with 2,000 seedlings. H. G. Zion, the Scout executive, is directing the work and will register the tree planters.

In Montana the Women's Clubs are pushing the tree-planting drive in connection with National Garden Week. Alma Margaret Higgins of the Home and Garden Division is one of the leaders in the work. A call to every club president to cooperate with the Association has been sent throughout the state.

In cooperation with Mrs. Walter Bowman, of the Conservation Department of the Wisconsin Federation of Women's Clubs, the American Tree Association has sent tree-planting instruction and application blanks to the club planters in that state.

Conservation chairmen of Delaware have been sent all the tree army's data including "Our Program" which is being widely distributed throughout the country. Mrs. William N. Miller, of Seaford, is pushing the work.

The Brockton, Mass., High School Agricultural Club has done a big work in planting thousands of white pines near that city. The planting was done at the direction of Annie L. Burke and Malcolm D. Marston as student supervisor.

The Central Junior High School of Kansas City, Kans., had a big Arbor Day celebration using the tree day programs and other data from the American Tree Association. Ella Parker directed the program.

The only way to join The American Tree Association is to plant a tree and register it with the Association, 1214 Sixteenth Street N.W., Washington, D. C. The Association will send tree-planting suggestions and a tree-day program for two cents to pay postage.

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